Natural Environment Research Council

ARASF

Atmospheric Research Airborne Support Facility

Flight Data Catalogue

Flight A579

20 September 1997

ACSOE

Frontal crossing flight

METEOROLOGICAL OFFICE

FLIGHT FOLDER

Flight No. A579

DATE: 20/9/97

Take off : 1100
Landing : 1750

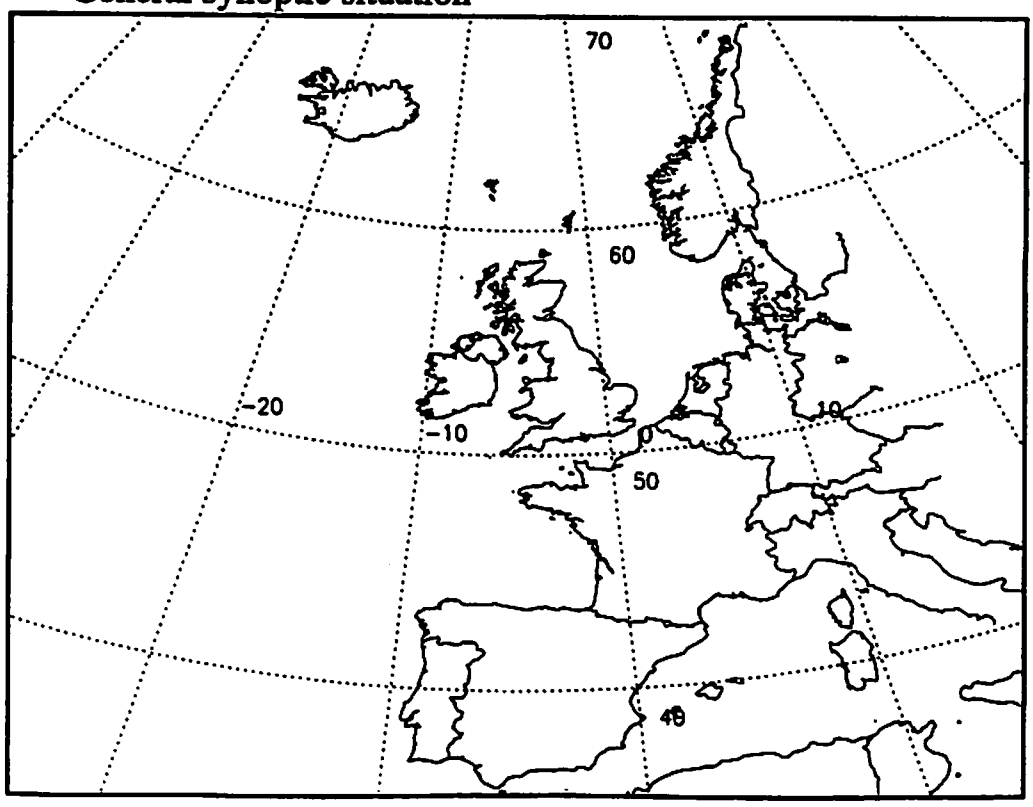
Aircraft Scientist : H. RICHER
Flight Leader : I. PUR
Others PERCA: T. GREEN
FORMALDEHYDE: G MILLS
CO: S. SCHMITGEN
PEROXIDE: B. DANDY
NOXY: S. BARRIOLHET
BOTTLES: D. BRYDEN
PSAP, CNC ETC: K. DEWEY
ECLIPSE: J VIENT

Captain : C. O'DOWD
Co-pilot : D. RANDALL
Navigator : J. AYERS
Engineer : K. QUICK
Loadmaster : M. LENNARDS

+ [redacted]
C. REEVES, P. MONKS } MISSION SCIENTISTS

Trials Instructions MRF1 : ACSOE
Operating area :

General synoptic situation



TIME :

A579, 20th September, 1997
ACSOE
North Atlantic near the Azores

Start time	End time	Event	Height(s)		Hdg	Comments
110242						Take off St Maria
111449	112746	R1	FL80		080°	
113416	120941	P1	50'	FL170	075°	
120941	121709	R2	FL170		355°	
121709	124648	P2	FL170	50'	355°	Bottles filled @ FL130 FL70,3000',500'.
124648	133550	P3	50'	FL240		Bottles filled @ 100' 3000'FL70,FL100,FL150, FL240
133550	134009	R3	FL240		280°	
134009	142645	P4	FL240	50'	295°	Bottles filled @ FL214 FL200,FL150,FL110,FL50 500'
142645	151323	P5	50'	FL260	275°	Bottles filled @ 100', FL50,FL110,FL150,FL200
151323	151822	R4	FL260		165°	
151822	160509	P6	FL260	50'	170°	Bottles filled @ FL200 FL150,FL130,FL110,FL50 500'
160509	165236	P7	50'	FL260	160°	Bottles filled @ 100' FL50,FL110,FL150,FL200
165236	165639	R5	FL260		160°	
165639	170520	P8	FL260	FL100	165°	
170520	1715	R6	FL100		165°	
175003						Land Santa Maria

Natural Environment Research Council

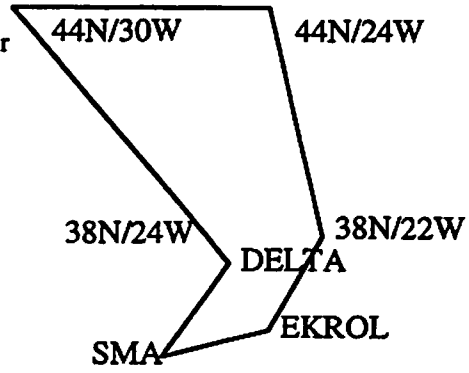
Atmospheric Research Airborne Support Facility
NERC Scientific Services

A579 ACSOE SCIENCE

September 20, 1997

SORTIE OBJECTIVE:

To observe the atmospheric chemical composition in Atlantic air North of the Azores. The data will be added to a systematically collected airmass data base and will be used to determine the oxidising capacity and the budget of tropospheric oxidants in marine air at mid latitudes in the northern hemisphere.



LOCATION:

Northeast Atlantic Ocean, North of the Azores.

WEATHER:

Cloud Free

FLIGHT PATTERN:

[1] Depart Santa Maria.
  [1.1] Hold climb at 3000 ft for wet chemistry check.

[2] Standard climb to FL080.
  [2.1] Run for NOxy Calibration (15 min).

[3] Standard descent to 50ft (or minimum safe altitude).

[4] Profile from 50ft (or minimum safe altitude) to maximum altitude — 500ft/min to top of boundary layer then 1000ft/min. Interupt profile at FL100 for zeroes.

[5] Stepped Sawtooth from maximum altitude to 50ft (or minimum safe altiude) — 1000ft/min to top of boundary layer then 500ft/min. Carry out zeroes and fill bottles as requested.

  [5.1] Repeat as time allows.

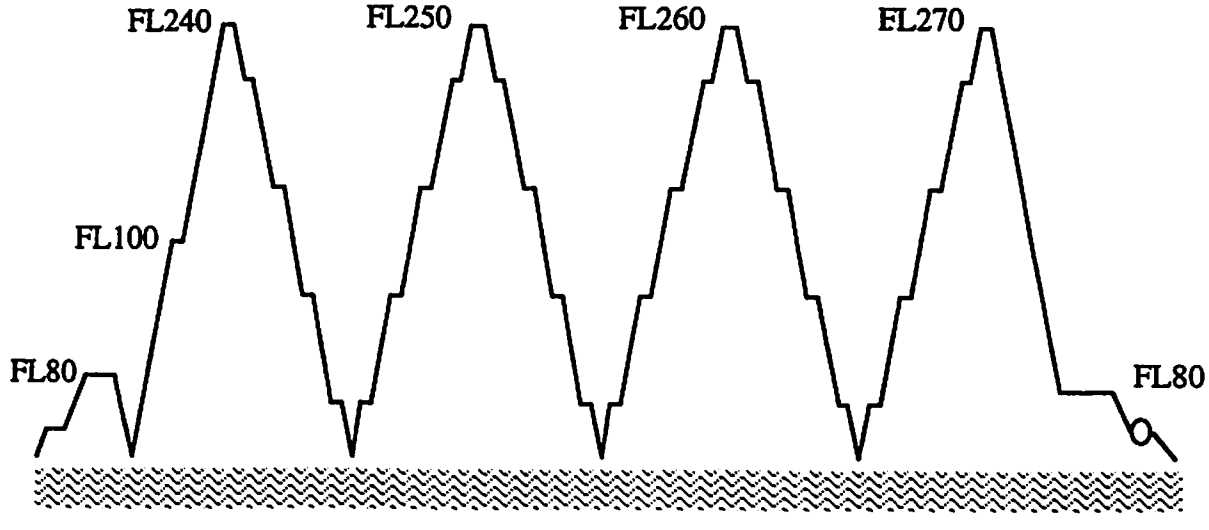
[6] Profile descent from maximum altitude to FL080.
  [6.1] Run for NOxy Calibration (12 min) — Science speed & Constant altitude
  [6.2] Run for NOxy Artifacts (15 min) — Constant altidude
  [6.3] Run for Noxy shut down (10 min) — Pilot/Nav discresion

[7] Return to Santa Maria, visual examination of Santa Mairia's coastal micro-meteorology.

[8] Land.

OTHER REQUIREMENTS: Cabin pressure and temperature to be kept constant on level runs. The NOxy should ideally be zeroed every 15 minutes. During profiles this should be done at the start of grab sample runs. Other instrument operators should perform zeros at this time if required.

TIME: **6 Hours and 30 Minutes**



AZORES/C-130

Science Brief for Flight of 20/9/97

Take off time 11:00Z.

Scientific Rationale

There is some indication from the trajectories that air north west of Santa Maria at around 20,000 ft may have been near the surface five days ago on the west of the US, lifted up to 20,000 ft and transported rapidly over Canada and out over the Atlantic. This type of flow seemed quite widespread based on the forecasts a couple of days ago. However the most recent forecasts suggest a more confused pattern. This is largely due to a frontal system moving from the west. The comparison flight with the P3 on Wednesday (17/9/97) was carried out in the clear air just in front (to the east) of this cold front. The P3 flew through the front on route to the rendezvous point and again on its return to St. Johns. The first cut was at FL 200 and within cloud the concentrations of NO_Y, HNO_3, and O_3 increased. The second cut was at FL 180 and again NO_Y and O_3 increased.

The plan is to fly in (almost) a triangular type pattern from 38N22W to 44N24W to 44N30W to 38W24W. The first leg will be east of the front and approximately perpendicular to the flow. The second leg will be east to west, across and perpendicular to the front. The third leg will be homeward to Santa Maria. Each leg will be made of deep stepped profiles up to high altitudes hoping to intersect air that has been transported over Canada. We will want to fly in cloud free air, but a fair amount of cloud is expected.

Suggested step levels on descent: FL250 (or max altitude), FL200, FL150, FL100, FL050, 500ft

Suggested step levels on ascent: 100ft, FL050, FL100, FL150, FL200, FL250 (or max altitude)

These may change, depending on observations.

Visual examination of Santa Maria's coastal micro-meteorology.

Landing at Santa Maria 17:30Z.

A579 20/09/97

Debrief

The original aim of the experiment, based on earlier trajectory calculations, had been to investigate high level transport of air from the US. However, the latest available trajectories, for flight planning, had not indicated such an outflow. It was therefore decided to use the meteorological situation to carry out a frontal crossing sortie. Profiles were carried out to the east of the cold front, through the cold front and to the west of the front before returning to Santa Maria. The surface cold front was marked by a band of mainly convective cloud: no precipitation was noted. The front was clearly not very active and the frontal zone ill-defined. However, interesting layers were observed with distinct changes in chemical and physical parameters. Although, the front was not very marked detailed analysis of the data may prove interesting.

AIRCRAFT SCIENTIST'S LOG

Aircraft Scientist: Archer

Project: ACSOE **Date:** 20/9/97

Flight No: A579 **Page** 1 **of** 10

Time GMT	Run Profile	Height	Heading INS	Latitude ..... Longitude	Other Information (eg: clouds, weather, visibility, winds, sea state etc.)
11:05:00		3000 feet Pres Rad (FL)	68	36.95 -24.75	3000 feet run. Slight inversion on tephi 900 mb (@ 1800 feet)
11:24:7		06 Pres Rad (FL)		37.00 -24.61	inversion. Small amounts of broken strato cu / cu beneath.
11:40:5		Pres Rad FL			are narrow strato cu sheet back to broken cu (3/8) by 11:44:9
11:44:9	Run 1	080 Pres Rad (FL)	65	37.84 -24.46	Noxy cal broken strato cu both above and below some larger cu in distance / Mixed strato cu / cu / strato cu below 4/8. Thicker strato cu above.
11:50:8		Pres Rad FL			
11:55:8		Pres Rad FL			Strato cu sheet below occasionally broken, thinner broken strato above
12:7:46	end Run 1/1	Pres Rad FL			
"	start P1	Pres Rad FL			No structure in CO, Nox, NOy, pt temp decreasing steadily.
		1800 Pres Rad FL			broken cu (small) at this level
11:34	P2	Pres Rad FL		37.56 -23.10	ascent from 80 feet TAT=22 a Dew=21 173/10 800 feet/min
11:35		8000 feet Pres Rad FL		37.62 -23.00	low cloud cu strato 500 feet thick height altitude 2 thickness varying.

38 N 22 W

AIRCRAFT SCIENTIST'S LOG

Aircraft Scientist: RICHER

Project: ACSOE **Date:** 29/09/97

Flight No: A579 **Page** 2 **of** 10

Time GMT	Run Profile	Height	Heading INS	Latitude ..... Longitude	Other Information (eg: clouds, weather, visibility, winds, sea state etc.)
1138	P2	2700 Pres Rad FL	68	37.68 -22.90	Above cloud at 2700 feet
					chem parameters identical on easy back up.
1140		Pres Rad FL			cloud free area
114330	P2	5200 Pres Rad FL	70	37.81 -22.50	above Stratocu / cu (small) 2/8
					NO cloud above
1146	P2	6600 Pres Rad FL	61	37.83 -22.43	Temperature inversion
					increased ozone / drier air
11		Pres Rad FL		37.95 -22.11	very shallow layer with O_3 decreasing from 50 - 25, No 40pt, CNC inc.
115102	interrupt P2	090 Pres Rad FL		38.00 -22.00	Interrupt, zeros for all instruments (except CH4)
115422	ascent P2	9000 Pres Rad FL	345		Max alt of profile FL170 due to ATC clearance
115735		Pres Rad FL			Some Stratocu now above 7/8
12		FL014 Pres Rad FL		38.70 -22.19	level with cloud altostratus
120630		15400 Pres Rad FL			Air dry, ont
120944	R2	130 Pres Rad FL		34.2 -22.34	zeros and battle run (no zero for periods

AIRCRAFT SCIENTIST'S LOG

Aircraft Scientist: R. CHER

Project: ACSOE
Flight No: A579

Date: 20/09/97
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Time GMT	Run Profile	Height	Heading INS	Latitude / Longitude	Other Information (eg: clouds, weather, visibility, winds, sea state etc.)
121709	P2	170 Pres Rad FL	345	39.58 / -22.45	1000 feet / min
122107	interrupt P2	130 Pres Rad (FL)		7	
122	recommence P2	Pres Rad FL			CO O_3 drop – most marked in O_3 down to 21 ppb from 60 ppb. (min 18 ppb O_3) ↑ 1227
122952		170 Pres Rad (FL)	342	40.36 / -22.65	ozone increasing again.
		Pres Rad FL			essentially the low O_3 was very distinct and found at different altitudes in different profiles – FL 210 in P2 FL 150 in P1.
		Pres Rad FL			Changes in O_3 also correspond with CO changes: – very well anticorrelated
12516	interrupt 3000 feet	Pres Rad FL		40.80 / -22.81	
1229	P2 recommence	Pres Rad FL		40.90 / -22.84	
1244	interrupt 500	500 Pres (Rad) FL		41.17 / -22.94	
124644	P3 (end P2)	Pres. Rad FL		41.29 / -229	TAS 164, TAT, 20.6, Dew 18.4, wind 163 / 8
125204	interrupt	3000 Pres Rad FL		41.57 / -238	

AIRCRAFT SCIENTIST'S LOG

Aircraft Scientist: RICHER

Project: ACSOE

Flight No: A579

Date: 29/09/97

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tops of fwd look to FL120

Time GMT	Run Profile	Height	Heading INS	Latitude / Longitude	Other Information (eg: clouds, weather, visibility, winds, sea state etc.)
125420	~~interrupt~~ return P3	8500 feet Pres Rad ~~FL~~	340	41.70 / -23.12	Strato cu below Strato, alto Stratus above
125843	interrupt P3	70 Pres Rad FL		42.01 / 23.22	03 45, CO 70 zero for chem instruments
130233	return P3	70 Pres Rad FL		42.18 / -23.28	Frontal cloud ahead to West : request change in heading to stay to the East of the front
130522	interrupt	100 Pres Rad FL			bottle fill. High cloud (cirrus) ahead to the East. Bulk of cloud including embedded cu/strato to the West. Alto cu above Strato below
1307	return P3	100 Pres Rad FL	032	42.50 / -23.27	change in Ow 1305
131		Pres Rad FL			change in Ow (back up) "warm side"
131324	interrupt	150 Pres Rad FL		42.71 / -22.93	bottle
131809	recommence P3	Pres Rad FL			
132946	interrupt	220 Pres Rad FL		43.84 / -22.12	turn + Cals
133228	recommence	220 Pres Rad FL	212		
133550		240 Pres Rad FL		43.51 / -22.21	topi shows much structure

AIRCRAFT SCIENTIST'S LOG

Aircraft Scientist: Rutter

Project: ACSR **Flight No:** A579 **Date:** 29/09/97 **Page** 5 **of** 10

Time GMT	Run Profile	Height	Heading INS	Latitude / Longitude	Other Information (eg: clouds, weather, visibility, winds, sea state etc.)
134009	P4	Pres / Rad / FL			
134406	interrupt P4	214 Pres / Rad / FL		43.35 / -22.84	bottle of FL240 last refilled FL214 above above
1345	recommence	Pres / Rad / FL		43.35 / -22.97	
134717	~~200~~ interrupt	200 Pres / Rad / FL			Cirrus + altostratus above, Stratocu below bottles
135044	restart	~~150~~ Pres / Rad / FL		43.39 / -23.40	
135323	interrupt	150 Pres / Rad / FL		43.50 / -23.88	bottles
135935	restart P4	150 Pres / Rad / FL		43.56 / -24.13	100 cloud above broken Stratocu below base of cloud base
		Pres / Rad / FL			Stratiform + cumuloform clouds seen – surface front?
140280		115 Pres / Rad / FL		43.61 / -24.36	Coming under Strat. form cloud
140352	interrupt	110 Pres / Rad / FL		43.63 / -24.49	under Stratiform cloud
140743	P4	Pres / Rad / FL		43.69 / -24.76	Restart

AIRCRAFT SCIENTIST'S LOG

Aircraft Scientist:

Project: ACSE **Date:** 20/09/97

Flight No: A579 **Page** 6 **of** 10

Time GMT	Run Profile	Height	Heading INS	Latitude ..... Longitude	Other Information (eg: clouds, weather, visibility, winds, sea state etc.)
14351 14436	Intercept	8000 Pres Rad FL	290	43-84 -25.44	entering tops of cumulus clouds / Stratocu base
14557	reciprt P4	Pres Rad FL			profiling down 500 feet/min in cloud.
		3500 Pres Rad FL			clear of cloud stratocu below strat form cloud above.
1421		Pres Rad FL			Back into cloud - Stratus Strat/form
14210		Pres Rad FL			Back out of cloud Back into 1423 - Stratus.
14234		800 Pres Rad FL			in thin stratus fog.
14254	reciprt P4	Pres Rad FL		44:00 -25.99	
14		50ft Pres Rad FL			
14274		100ft Pres Rad FL		44.01 -26.07	TAT 19.4, DEW 18.2 wind 224/3 — mostly clear band of stratocu ahead.
14298		Pres Rad FL			going through top of cloud - marked change in OAT
		50 Pres Rad FL			

Atmospheric Research Airborne Support Facility **NERC Scientific Services**

14325

ETA 1755

AIRCRAFT SCIENTIST'S LOG

Aircraft Scientist: RICHER

Project: ACSOE **Flight No:** A579 **Date:** 20/9/97 **Page** 7 **of** 10

Time GMT	Run Profile	Height	Heading INS	Latitude ..... Longitude	Other Information (eg: clouds, weather, visibility, winds, sea state etc.)
143725		5000 Pres (Rad) FL			⊘
144336		110 Pres Rad (FL)		44·08 -27·40	1441 awards marked change in NO_x, NOy base layer uniform to starboard - humidity dec. ozone inc. / CO - ~~no really marked change~~ changes increases but not so markedly as pps
144622	start PS	Pres Rad FL			
145003	interrupt	150 Pres Rad (FL)	267	44·09 -27·80	
145406	restart	150 Pres Rad FL		44·09	FL100 → FL150 high O_3 & NOy Hazy below some cirrus to port.
150026	interrupt	200 Pres Rad FL	258	44·04 -28·54	some cumulus clouds in distance to starboard
150325	restart	200 Pres Rad (FL)	288	44·05 -28·91	high NO_x, NOy, O_3, FL170 → FL200 No cloud above or below
15		200 Pres Rad FL		44·02 -29·42	wind 235/27
151323	R4 end PS	200 Pres Rad (FL)	257	44·02 -29·60	- marked dondy to Starboard
151822	P6 end R4	200 Pres Rad (FL)	153	43·89 -29·53	
152454	interrupt P6	200 Pres Rad (FL)		43·54 -29·44	bottom

(23)

AIRCRAFT SCIENTIST'S LOG

Aircraft Scientist: RICHER

Project: ACSOE **Flight No:** A579 **Date:** 20/09/97 **Page** 1 **of** 10

Time GMT	Run Profile	Height	Heading INS	Latitude ..... Longitude	Other Information (eg: clouds, weather, visibility, winds, sea state etc.)
152820	P6 restart	250 Pres Rad (FL)		.....	.....
153404	interrupt	150 Pres Rad (FL)		43.9 ..... -28.94	structure in O_3 + NO_y not so clear on this profile.
153722	restart P6	13 Pres Rad FL		42.88 ..... -28.77	
153935	interrupt	130 Pres Rad (FL)	154	42.64 ..... -28.13	
154313	restart P6	Pres Rad FL		42.59 ..... -28.47	
154511	interrupt	110 Pres Rad (FL)		42.49 ..... -28.38	(broken) altostratus above "/some cirrus 4/8 (CKS rolling below but some small cu to port side.
154908	restart	110 Pres Rad (FL)	184	42.30 ..... -28.14	cirrus above / stratiform clouds above 4/8 few small cu below. (less than 1 okta)
155220	.....	7800 Pres (Rad) FL		42.15 ..... -28.85	haze layer temp inversion (7700 feet 750 mb)
	.....	~ Pres Rad FL		.....	-no cloud at this level but almost saturated on tephi =
155458	interrupt	50 Pres Rad (FL)		42.02 ..... -27.93	
155655	restart P6	Pres Rad FL		41.94 ..... -27.86	very hazy / misty

AIRCRAFT SCIENTIST'S LOG

Aircraft Scientist: RICHER

Project: AC80E **Flight No:** A579

Date: 20/09/97 **Page** 9 **of** 10

Time GMT	Run Profile	Height	Heading INS	Latitude ..... Longitude	Other Information (eg: clouds, weather, visibility, winds, sea state etc.)
160249		850 Pres Rad FL			bottle run
					frontal cloud to dirt / front of plane
160349		Pres Rad FL		41.63 -27.60	some small cu above 3/8
160412	restart P6	Pres Rad FL	153	41.61 -27.59	" (high cloud above that?)
160509	end P6 start 7	50 Pres Rad FL			
160524	interrupt P7	100 Pres Rad FL	154	41.55 -27.55	"
160942	restart P7	Pres Rad FL		41.38 -27.42	ascending over small cu (2/8) further small cu above (2/8) above that stratocu
161402		500 Pres Rad FL			
161502		500 Pres Rad FL			
161402		50 Pres Rad FL		41.12 -27.22	Above 8/8 stratocu deck shad from cloud above / cirrus
161814		Pres Rad FL		40.97 -27.06	dust in cloud top
161827	restart P7	Pres Rad FL		40.96 -27.08	ascending over stratocu deck altocu above

AIRCRAFT SCIENTIST'S LOG

Aircraft Scientist: RICHER

Project: ACSOE **Date:** 20/9/97

Flight No: A579 **Page** 10 **of** 10

Time GMT	Run Profile	Height	Heading INS	Latitude / Longitude	Other Information (eg: clouds, weather, visibility, winds, sea state etc.)
162356	~~Intercept~~	110 Pres Rad (FL)	149	40.72 / -26.88	ozone increases bup to this level (up to 50 ppb)
162635		Pres Rad FL			Stratocu below us now broken
162710	restart P7	110 Pres Rad FL	148	40.58 / -26.6	Now mostly over clear sea 4/8 upper/mid level cloud above. →
163054		50 Pres Rad FL		40.35 / -26.34	NOy increases to Max at about FL130
163534	restart P7	110 Pres Rad (FL)		40.17 / -26.14	2/8 sreall cu below, some stratiform cloud above
164025	~~Intercept~~	200 Pres Rad (FL)		39.90 / -25.84	2/8 cloud (altocu) above some cirrus
164432	restart	200 Pres Rad (FL)		39.70 / -25.63	lenticular cloud form islands seen
165236	~~Run~~ ~~Intercept~~ run 5	260 Pres Rad (FL)	148	37.01 / -25.00	Latte fill NOy 0.35, O3 58
165659	P8	260 Pres Rad (FL)		39.00 / -24.92	Normal ~~or~~ en route descent to FL100. Cirrus above variable cloud below - mne
170520	Run 6	Pres Rad FL			directly below at 2000 feet/mni (least 1000, 1000 feet apart)
		Pres Rad FL			

Interactive Processing Log

Flight No. A579 **Date:** 20/9/97 **User:** NERC
Interactive by: Dave Tiddeman
Date: 8/10/97

Renav

Kalman Filtering

TWC

Profile plotted : N_D
Line chosen : **Profile** / **Whole flight** / **Other**

a = − 2.247
b = + 0.3527 $\times 10^{-2}$
c = + 0.2276 $\times 10^{-6}$

LWC

OK (no PMS data)

Heimann / Barnes

OK

Flight Leader's Pre/In-Flight Check List

Flight No: A579 Date: 20/4/97 Page 1 of 1

CHEK for auto selection

GMT	PARA	NO	D.R.S.	DECODE	INSTRUMENT	EXPECTED VALUES INFLIGHT | *PREFLIGHT*
	REF +	5	0567			Approx 0568
	REF -	7	2853			Approx 2858
	AOSS	19	0000	F/S O/S	TORQUE 4-5	2047 st. and level
	AOA	18	4057	F/S O/S	TORQUE 3-5	2047 st. and level
	RD HT	37	0000	✓		As Indicated | 0000
	PR HT	8	3848	0.0 ✓		As Altimeter
	CABP	14	3328	1010	✓	
	A/S	9	0084	✓		As ASI |0000 – 0100
	UP1S	81	0042		JOID	
	UP2S	82	0605			
	UIRS	83	0258		JNO2	
	UP1Z	84	0240		JOID	Approx 0147
	UP2Z	85	0144	✓		Approx 0149
	UIRZ	86	0232		JNO2	Approx 2061
	UP1T	87	0492		JOID	As IAT
	UP2T	88	2386	24		As IAT
	UIRT	89	0000		JNO2	As IAT
	LP1S	91	0030		JOID	
	LP2S	92	0148			
	LIRS	93	0011		JNO2	
	LP1Z	94	0023		JOID	Approx 0150
	LP2Z	95	0149	✓		Approx 0146
	LIRZ	96	0011		JNO2	Approx 2050
	LP1T	97	0000		JOID	As IAT
	LP2T	98	2352	24		As IAT
	LIRT	99	0000		JNO2	As IAT
	J/W	42	0000	0 ✓		As Indicated | 0000
	HYGR	58	3154	22		
	HYCC	59	0707			696–901
	FDEW	138	2223	11		DP = (DRSU/20)-100 C
	FSTA	139	0608			
	DTF	10	20666	94		
	DTC	11	6			
	NDTF	23	1768	23		same as De-Iced
	NDTC	24	6			
	INCT	48	2739			
	HEIM	141	2652			
	PRTC	142	2384	✓		approx 2380
	TWCD	70	4045			0000–4094
	TSAM	72	0486	✓		0640–1860 | < *min*
	O3	100	0000			
	O3P	106	2059			P≃ $(DRSU \times 0.4) + 145mB$
	O3RG	113	1948			

Flight Leaders' Pre/In-Flight Check List

BCDS for auto selection

GMT	PARA.	NO.	H/D	D.R.S.	DECODE	INSTR	EXPECTED VALUE
	FL NO	1	Hex	579			Flight No.
	GMTH	2	Hex	0090			Clock: First 4 No.s
	GMTM	3	Hex	0543			Clock: Last 4 No.s
	E/M	4	Hex	7			Event Mark Counter
	INCH	49	Dec				Multipxd Hkeeping
3766	3856 1500	3764	0485	3766	3689	3768	0737
	LATC	160	Dec	4094			Latitude
	LONC	161	Dec	4094			Longitude

Total Water Content Meter Check List

TOTW for auto selection Height: 0

GMT	PARA	NO	D.R.S.	DECODE	INSTRUMENT FITTED	EXPECTED VALUES INFLIGHT	*PREFLIGHT*
	TWCD	70	4095	TWC	4095 ✓	0001–4095	
	TNOS	71	4095		1225 ✓	2000–3460	*< min*
	TSAM	72	0485 ✓		0192 ✓	0640–1860	*< min*
	TAMB	73	1746	5 NUT	25460 ✓	2400–3200	
	TSRC	74	1007	HTR	2254 ✓	2160–2470	
	HTR1	75	2054 ✓		2059 ✓	0000–4095	< 4095
	HTR2	76	2053 ✓	FITTED	2115 ✓	0000–4095	< 4095
	ISRC	77			1023 ✓	0001–1230	*< min*
	STAT	78			4088	4095	
	EV1V	170			2043		
	EV2V	171			2043		
	NPWR	172			3352		
	EVIC	173			3968		
	EV2C	174			3968		

EMS 1900

BROAD BAND RADIOMETER FIT (pre-Flight only)

	PARA NO	POSITION	DOME	COVERS	OBSCURERS
UPPER	81,84,87 82,85,88 83,86,89	Port Stbd Centre	Clear (Quartz) Red Silicon (All)	(Off) / On	Large/(Small)
LOWER	91,94,97 92,95,98 93,96,99	Port Stbd Centre	Clear (Quartz) Red Silicon (All)	(Off) / On	

Flight Leader's In-Flight Log

Flight No A 579 Date 20/9/97 Page 1 of 2

Video Tape	
No.	A579 #1
Ends	1411
FFC / DFC / RFC	

	GPS	INU
Lat	36°58.4N	36°57.36N
Long	025 09.48W	025° 09.46W
Time	0848	0844
Status	5's	GC ALIGN

DRS recording to HORACE (y) / n

HORACE recording to disc (y) / n

SATCOM sending pos. reports (y) / n

GMT	EVM	Height	QNH	Hdg	IAS	TAT	DP	DI Htr		Wind/ Sea st.
08282				DATA	ON					
102850				SET	INU TO NAV					
110242				T/O	START MANUAL					
111107	9			START	VIDEO A579#1			COUNT = ZERO		
				START	RUN 1					
111449	10	FL80		080						
112746	11	FL80		080	END RUN 1					
113416	12	50'	1026	075	START P1 ↗					SS=4
115102	13	FL90		075	INTERRUPT P1 —			INSTRUMENT ZERO's		
115422	14	FL90		355	RESTART P1 ↗					
120941	15	FL70		355	END P1 / —		BOTTLE FILL			FL70 200 130 70 200 3000 500
					START RUN 2					
121709	16	FL70		355	START P2 / END RUN 2 /					
122407	17	FL130		355	INTERRUPT P2 —		BOTTLE FILL			
122747	18	FL130		355	RESTART P2					
122952	19	FL70		355	INTERRUPT P2 —		ZERO's	BOTTLES		
123324	20	FL70		355	RESTART P2					
123756	22	3000'		355	INTERRUPT P2 —		BOTTLE FILL			
123950	23	3000		355	RESTART P2 ↓ 500'/MIN					
124359	24	500'		355	INTERRUPT P2					
124538	25	500'		355	RESTART P2					
124648	26	50'	1023	360	END P2 / START P3					SS=5
124706	27	100'		355	INTERRUPT P3 —		BOTTLE	FILL		
124916	28	100'		350	RESTART P3 ↗					3000' FL70
125204	29	3000'		355	INTERRUPT P3 —		BOTTLE	FILL		FL100, FL150
125420	30	3000		350	RESTART P3					FL140

Research Flight

Video Tape	
No.	A579#1
Ends	1411
FFC / DFC / RFC	

	GPS	INU
Lat	41°53·53N	42 15·33 N
Long	023 09.26W	093 16·13W
Time	1258	1304
Status	5½	NAV

DRS recording to HORACE	(y) / n
HORACE recording to disc	(y) / n
SATCOM sending pos reports	(y) / n

GMT	EVM	Height	QNH	Hdg	IAS	TAT	DP	DI Htr		Wind/ Sea st.
125843	31	FL70		355	INTERRUPT P3 — BOTTLE FILL					100, 3000' FL70, ALSO FL140
130233	32	FL70.		355	RESTART P3					
130522	33	FL100			INTERRUPT P3					
130752	34	FL100		345	RESTART P3			(4)	44·00·0	
131324	35	FL150		040	INTERRUPT P3				22 00·0	
131703	36	FL150		040	RESTART P3					
132946	37	FL220			INTERRUPT P3 — REPOSITION					
133228	38	FL220		215	RESTART P3					
133530	39	FL240		225	END P3 — BOTTLE FILL / START RUN 3					
134009	40	FL240		280	END RUN 3 / START P4					R220
134241	41	FL 260		280	INTERRUPT P4 — BOTTLE FILL					
134543	42	FL 214		250	RESTART P4					
134717	43	FL200		280	INTERRUPT P4 — BOTTLE FILL					
135044	44	FL200		280	RESTART P4					
135613	45	FL150		295	INTERRUPT P4 — BOTTLE FILL					
135938	46	FL150		295	RESTART P4					
140352	47	FL110		295	INTERRUPT P4 — BOTTLE FILL					
140763	48	FL110		295	RESTART P4					
141341	51	FL150		305	INTERRUPT P4 — BOTTLE FILL					
141121	49				STOP VIDEO A579#1 COUNT = 6071					
141212	50				START VIDEO A579#2 COUNT = 0000					
141557	52	FL150		295	RESTART P4					
142349	53	500'		295	INTERRUPT P4 — BOTTLE FILL					
142544	54	500'		290	RESTART P4					
142645	55	50'	1017		END P4 / START P5			SS=4		100 500 FL110 FL150 FL220 FL40
142701	56	100'		295	INTERRUPT P5 — BOTTLE FILL					
142901	57	100'		295	RESTART P5					
143412	58	FL50		295	INTERRUPT P5 — BOTTLE FILL					
143725	59	FL50	29.90		RESTART P5					
144336	60	FL110		280	INTERRUPT P5 — BOTTLE FILL					
144602	61	FL110		280	RESTART P5					
145033	62	FL150		290	INTERRUPT P5 — BOTTLE FILL					
145406	63	FL150		280	RESTART P5					
150014	65	FL200		275	INTERRUPT P5 — BOTTLE FILL					

1 Research Flight

Flight Leader's In-Flight Log

Flight No A 579 Date 20/9/97 Page 2 of 2

Video Tape	
No.	A579#2
Ends	1712
FFC / DFC / RFC	

	GPS	INU
Lat	43 46.85N	43 42.15N
Long	029 40.48	29 36.86W
Time	1521	1522
Status	5's	NAV

DRS recording to HORACE (y) n

HORACE recording to disc (y) n

SATCOM sending pos. reports (y) n

GMT	EVM	Height	QNH	Hdg	IAS	TAT	DP	DI Htr		Wind/ Sea st.
150325	66	FL260		275	RESTART P6					
151523	67	FL260		270	[redacted] P5 END/ START RUN 4					
151822	68	FL260		165	END RUN 4 / START P6 ↓					
152454	69	FL200		170	INTERRUPT P6		— BOTTLE	FILL		100 150 (110) 500
152820	70	FL200		170	RESTART P6					
153604	71	FL150		170	INTERRUPT P6		— BOTTLE	FILL		
153722	72	FL150		170	RESTART P6					
153835	73	FL130		170	INTERRUPT P6		— BOTTLE	FILL		
154643	74	FL130		170	RESTART P6					
154511	75	FL110		170	INTERRUPT P6		— BOTTLE FILL, ZERO's			
154908	76	FL110		170	RESTART P6					
155458	77	FL150		170	INTERRUPT P6		— BOTTLE FILL			
155655	78	FL150		170	RESTART P6					500'/min @150
160204	80	500'		170	INTERRUPT P6		— BOTTLE	FILL		
160412	81	500'		170	RESTART P6					
160509	82	50'	1018	170	END P6 / START P7					SS=4
160524	83	100'	1018	170	INTERRUPT P7		— BOTTLE	FILL		
160622	84	100'			RESTART P7					
161402	85	FL150		170	INTERRUPT P7		— BOTTLE	FILL		ZERO's
161827	86	FL150		170	RESTART P7					
162356	87	FL110		165	INTERRUPT P7		— BOTTLE	FILL		
162710	88	FL110		165	RESTART P7					
163054	89	FL150		165	INTERRUPT P7		— BOTTLE	FILL		
163524	90	FL150		160	RESTART P7					
164025	91	FL200		160	INTERRUPT P7		— BOTTLE	FILL & ZERO's		
164432	92	FL200		160	RESTART P7					
165236	93	FL260		160	END P7 / START RUN 5		— BOTTLE	FILL		
165639	94	FL260		165	END RUN 5 / START P8					

Research Flight

Video Tape
No.
Ends
FFC / DFC / RFC

	GPS	INU
Lat		
Long		
Time		
Status		

DRS recording to HORACE (y) / n

HORACE recording to disc (y) / n

SATCOM sending pos reports y / n

GMT	EVM	Height	QNH	Hdg	IAS	TAT	DP	DI Htr		Wind/ Sea st.
170510	95	FL100		165	START RUN 6 // INTERRUPT PT					
170632	96				SPOT VIDEO A5794#2 COUNT = 5941					
170712	97				START VIDEO A5794#3 COUNT = 0220					
1715					END RUN 6					
175003					LAND ST MAWGAN					
					VIDEO OFF 1757					
175250			DATA OFF				GPS POSITION			
							36 58·36 N			
							2 10·00 W			

Research Flight

VIDEO TAPE LOG

Flight No A 579

Project ACSOE Date 20/9/97

Tape No A579#1 User H. RICHER Retention Period INDEF

GMT	Tape Counter	Camera Position	Remarks
111101	0000	FFC	START RECORDING
141124	6071	FFC	END OF TAPE

Met Research Flight

VIDEO TAPE LOG

Flight No A A579

Project ACSOE Date 20/9/97

Tape No A579 #2 User H. RICHER Retention Period INDEF

GMT	Tape Counter	Camera Position	Remarks
141212	0080	FFC	START RECORDING
170632	5941	FFC	END RECORDING

Met Research Flight

VIDEO TAPE LOG

Flight No A A579

Project ACSOE

Date 20/9/97

Tape No A579 #3 User H. RICHER

Retention Period INDEF

GMT	Tape Counter	Camera Position	Remarks
1701Z	0000	FFC	START RECORDING VIEWS OF MAINLAND ISLAND FLIGHT
1757	—	FFC	STOP RECORDING — CANADA

Met Research Flight

SAMPLE BOTTLE RECORD

Flight No. A579 Date 14 9 97 Sheet no. 1/3

Sample no.	Bottle no.	Time	E/M	Height	PRESSURE PURGE TIME	PRESSURE FILL TIME	PRESSURE END TIME	True pressure (mb)	Remarks (RUN NO. etc).
1	R3	121250		FL 170	120900	121250	121453	527	6.2 bar RUN 2 ON P1
2	B51	122221		130	122107 121900	122221	122338	622	7 bar P2
3	R12			070	122952 122700	123239	123314	784	7 bar P2
4	R27			3000	123754 123430	123905	123927	923	7 bar P2
5	P3 B1			500	124557 124200	124510	124529	1009	7 bar P2
6	Z10			100	124706 124628	124830	124903	1021	7 bar P3
7	B53			3000	135204 125100	125340	125410	919	7 bar P3 500 3000
8	Z11			FL 070	125843 125500	130150	130225	785	7 bar P3 070
9	A8			FL 100	130522 130330	130700	130741	690	7 bar P3 100 130
10	R15			FL 150	131330 130830	131610	131755	575	6 bar P3
~~11~~	~~Z12~~	X		FL 240	133120 ~~133450~~		133950	395	4.04 RUN 3 P4
11	Z12			FL 214	134200	134413	134535	439	4.8 P4 200 150
12	R26			FL 200	134617 134600	134854	135036	466	5.0 P4 5000
13	R14			FL 150	135423 135220	135805	135935	573	6.4 P4 500
14	H08			FL 110	140352 140130	140633	140739	671	7 bar P4
15	#12			FL 050	141351 140500	141505	141550	-	7 bar P4
16	Z13			500	142350 142100	142517	142542	1002	7 bar P4
17	Z14			~~100~~ ~~050~~	1427	142810	142854	1016	7 bar P5 500 ~~300~~ ~~150~~
18	#3			FL 050	143412 143000	143648	143722	846	7 bar P5
19	P3 B3			FL 110	144346 144038	144529	144615	671	7 bar P5 200
20	HAR 7			FL 150	144800	145215	145400	574	6.7 bar P5

SAMPLE BOTTLE RECORD

Light No. A579 Date 20/9/97 Sheet no. 2/3

Cycle	Bottle no.	Time	E/M	Height	PRESSURE: PURGE TIME	PRESSURE: FILL TIME	PRESSURE: END TIME	True pressure (mb)	Remarks (RUN no. etc.)
21	P3 B4			FL 200	150014 145530	150145	150321	466	5 bar P5
22	Z 15			FL 260	151323 150455	150546	150758	362	3.95 bar RUN 4
23	Z 16			FL 200	152454 151900	152638	152815	465	5 bar P6
24	Z 17			FL 150	153404 153000	153535	153720	524	5 bar P6
25	Z 18			FL 130	153935 153831	154145	154310	621	7 bar P6
26	R 18			FL 110	154511	154800	154903	674	7 bar P6
27	VEA D*			FL 50	155458 155100	155600	155631	846	MAX PRESS 40 PSI * 2-7 bar P6
28	VEA G*			FL 500	160204 160000	160345	160408	1002	2.7 bar P6
29	NILU 317			100	160524	160755	160815	1017	4.5 bar P7
30	NILU 408			FL 50	161402	161700	161737	844	4.5 bar P8
31	NILU 320			FL 110	162356 161930	162622	162705	670	P8 4.5 bar 5 to 1 to 200
32	N 309			FL 150	163059 1628	163200	163523	573	260 4.5 bar

SAMPLE BOTTLE RECORD

ight No. 529 Date 20 9 97 Sheet no. 3/3

ple	Bottle no.	Time	E/M	Height	PRESSURE PURGE TIME	PRESSURE FILL TIME	PRESSURE END TIME	True pressure (mb)	Remarks (RUN NO. etc).
3	N 303			FL 200	164025	164329	164431	463	4.5 bar
4	N 331			FL 260	165320 164630	165520	165620	363	3.8 bar

PAN GC Log

GC Sample record			Flight Number: AS79					Operator: Josh Kerr.				Date: 20/9/97.				
Sample No.	Time	Height	Channel 1					Channel 2				Channel 3				Comments
			Optimisation = 13					Optimisation = 8				Optimisation = 12				Good optimisation.
			Back Flush = 44					Back Flush = 43				Back Flush = 45.				
			Flow rate = 42					Flow rate = 41				Flow rate = 41.				
			ST	SP	DT	DP	BT	ST	SP	DT	DP	ST	SP	DT	DP	
1	112250	FL80	485	1249				515	1568			481	1538			
2	115050	FL90	470	1150				504	1455			469	1416			
3	115652	FL110	469	1106				502	1404			467	1367			
4	120304	FL140	467	1022				501	1300			466	1266			
5	120852	FL170	465	969				500	1195			465	1176			
6	122129	FL230	464	1061				500	1348			466	1332			
7	123025	FL270	462	1252				499	1621			466	1584			
8	123812	3000'	461	1393				498	1812			465	1754			
9	124400	500'	460	1467				498	1836			465.	1832			
10	125220	3000'	460	1372				496	1773			466	1674			
11	125910	FL70	461	1223				498	1556			467	1519			
12	130534	FL100	465	1460				499	1465			469	1627			

DATE 20 SEP 97	FTI No 01	FLT No A 579	NAV AYERS
DEPARTURE AIRFIELD SANTA MARIA		ATIS I6 210/06 10K 22/22 1023	
ATC CLEARANCE EKROR 38/22 44/24 44/30 38/24 DELTA			TAKE OFF TIME 1102

X3500 LTBKOL (FL170.) 220/12

TIME	FIN 1012			IAS	TAS	W/V	ALT FL	QNH	GPS	RUN IDENT
	HDG	DR	G/S						LAT/LONG	
1114 49	070	Ø	221	183	212	229/16	F080	1023	3702.5 02428.0	R1
1127 46									3720.2 02331.5	ER1
1134 16	061	2P	192	182	196	173/18	50'✓	1026	3733.2 02307.0	P1
1151 02							F090		3759.0 02201.4	IP1
1154 22							F090		3809.7 02200.1	RP1
1209 41							F170		3905.1 02216.2	IP1/R2
1217 09							F170✓		3934.0 02224.9	ER2/P2
1221 07							F130		3949.1 02229.3	IP2
1229 52							F070		4020.4 02237.4	IP2
1237 56	341	4S	206	184	196	208/13	3000	1026	4048.0 02246.6	IP2
1243 59							500		4108.2 02253.3	IP2
1246 48						161/15	50'✓	1000✓	4117.4 02256.4	EP2/RP3
1252 04							3000		4134.7 02302.8	EIP3
1258 43							F070		4157.0 02310.4	IP3
1305 22							F100		4220.5 02318.4	IP3
1313 24							F150		4248.7 02259.4	IP3
1324 46							F220		4349.2 02207.0	IP3
1332 28	2						F220✓		4344.7 02201.5	RP3
1335 50	212	6P	238	174	259	258/36	F240		4332.5 02209.8	EP3/R3
1340 09	271	Ø	247	184	269	268/33	F240		4321.1 02224.2	ER3/P4
1347 17							F214 F200		4322.0 02302.8	IP4 IP4
1356 23							F150		4330.1 02349.8	IP4
1403 52							F110		4338.0 02425.3	IP4
1413 41							F050		4349.3 02508.8	IP4
1423 49							500'	10	4358.9 02549.4	IP4

ARRIVAL AIRFIELD	LANDING TIME
ATC CLEARANCES	TAKE OFF
ATIS	FLIGHT TIME

DATE	FTI No	FLT No	NAV Ayers
DEPARTURE AIRFIELD		ATIS	
ATC CLEARANCE			TAKE OFF TIME 1100

TIME	FIN 1012			IAS	TAS	W/V	ALT FL	QNH 1020	GPS LAT/LONG	RUN IDENT
	HDG	DR	G/S							
1426[45]							50↗100		4400.7 02601.0	EP4/RP4 P5
1434[10]							F050		4405.8 02631.1	IP5
1443[34]	268	7S	200	181	219	219/30	F110		4405.0 02710.7	IP5
1450[33]							F150		4406.0 02742.8	IP5
1500[14]							F200		4405.8 02826.8	IP5
1513[23]							F260		4402.2 02932.8	EP5/R4
1518[22]	152	10P	273				F260		4354.5 02950.7	ER4/P6
1524[54]	154	8P	243	180	249	234/44	F200		4332.9 029259	IP6
1534[04]							F150		4303.1 02854.8	IP6
1539[35]							F130		4246.5 02837.3	IP6
1545[11]							F110		4230.0 02821.1	IP6
1554[58]							F050		4202.3 02754.5	IP6
1602[04]	154	3P	181	181	187	234/15	500		4142.8 02738.3	IP6
1605[09]							50↗100		4134.6 02732.0	EP6/P7
1614[02]							F050		4110.4 02712.7	IP7
1623[56]							F110		4044.4 02645.0	IP7
1630[59]							F150		4024.6 02622.7	IP7
1640[25]							F200		3957.2 02552.1	IP7
1652[56]	150	7P	250	156	245	248/35	F260		3916.8 02509.3	IP7/R5
1656[39]							↘F200		3902.0 02455.1	ER5/P8
1705[20]	157	7P	207	180	218	238/23	F100		3825.0 02424.1	IP8/[illegible]

ARRIVAL AIRFIELD	LANDING TIME 1750
ATC CLEARANCES	TAKE OFF 1100
ATIS H 1022. H/W16 200/19 101C 25/ 1022	FLIGHT TIME 650

FLIGHT LEADER'S INSTRUMENT STATUS REPORT

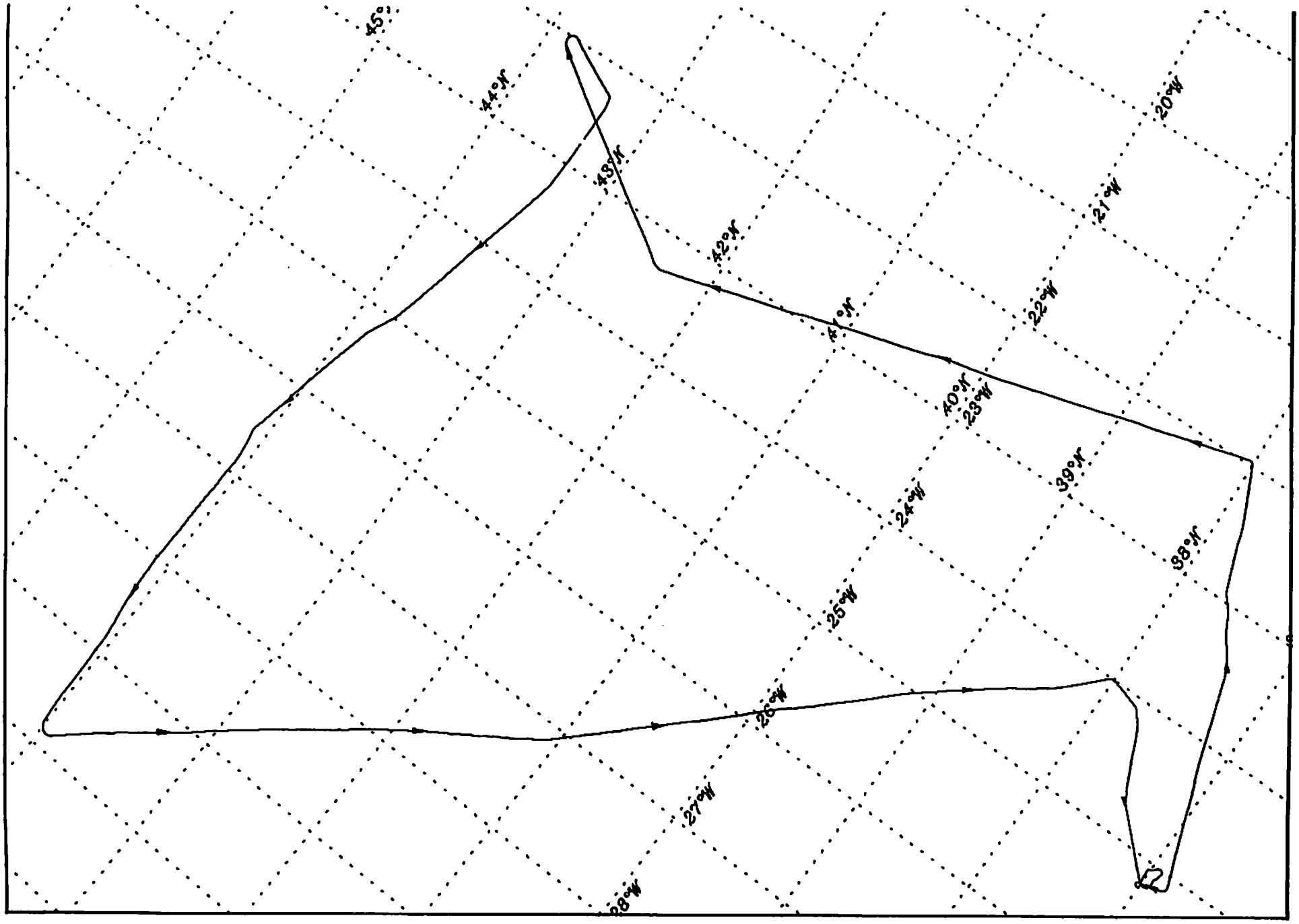
FLIGHT NO: A579 DATE: 20 / 9 /97 MRF | AESOE

INSTRUMENT	FITTED	OPERATED	COMMENTS
NAVIGATION:			
GPS	✓	✓	
OMEGA	✓	✓	
INU	✓	✓	
RADALT	✓	✓	
THERMOMETERS:			
DI TEMP	✓	✓	
NDI TEMP	✓	✓	
ICTP	✓	✓	
HEIMANN			
HYGROMETERS:			
GEN. EASTERN	✓	✓	
TWC	✓	✓	
FWVS	✓	✓	
J/W	✓	✓	
EXP. PITOT HEAD:			
STATIC PRESS.	✓	✓	
PITOT PRESS.	✓	✓	
GUST VANES	✓	✓	
RADIOMETERS:			
UPPER CLEAR	✓	✓	JO^1D
UPPER RED	✓	✓	
UPPER SILICON	✓	✓	JNO_2
LOWER CLEAR	✓	✓	JO^1D
LOWER RED	✓	✓	
LOWER SILICON	✓	✓	JNO_2
MARSS	X		
SAFIRE	X		
DEIMOS	X		
ARIES	X		
CHEMISTRY:			
OZONE	✓	✓	
ECGC	✓	✓	
NOX	✓	✓	
OTHERS:			
CCN	X		
CLOUD PHYSICS	X		
CABIN PRESS	✓	✓	
NEPHELOMETER	X		
PSAP	✓	✓	

P.T.O. FAULTS/INCIDENTS

A579

GPS data
08:05:09 – 17:50:31



LIST OF FORMS USED ON FLIGHT

No. of forms	Form Title
	Aircraft Scientist de-briefing sheet Aircraft Scientist log Aircraft Scientist post flight requirements sheet Interactive log
	Flight Leader pre-flight check form Flight Leader in-flight check form Flight Leader in-flight log Flight Leader Video tape log (photocopy original)
	~~SAFIRE log~~ ~~CCN log~~ ~~MARSS log~~ ~~DEIMOS log~~ Chemistry log BOTTLES, ETC
	~~Particulate / Filter boom Operator's log~~ ~~2DC / FSSP / Holography Operator's log~~ ~~Sonde Ejector's log~~ Navigator's log ~~Photographic log (photocopy original)~~
	Instrument status forms RTD prints Raw data plots Weather charts Satellite pictures GPS track

METEOROLOGICAL OFFICE FAX F 28

ASXX EGRR MSLP ANALYSIS DT 0000 UTC 20 SEP 1997

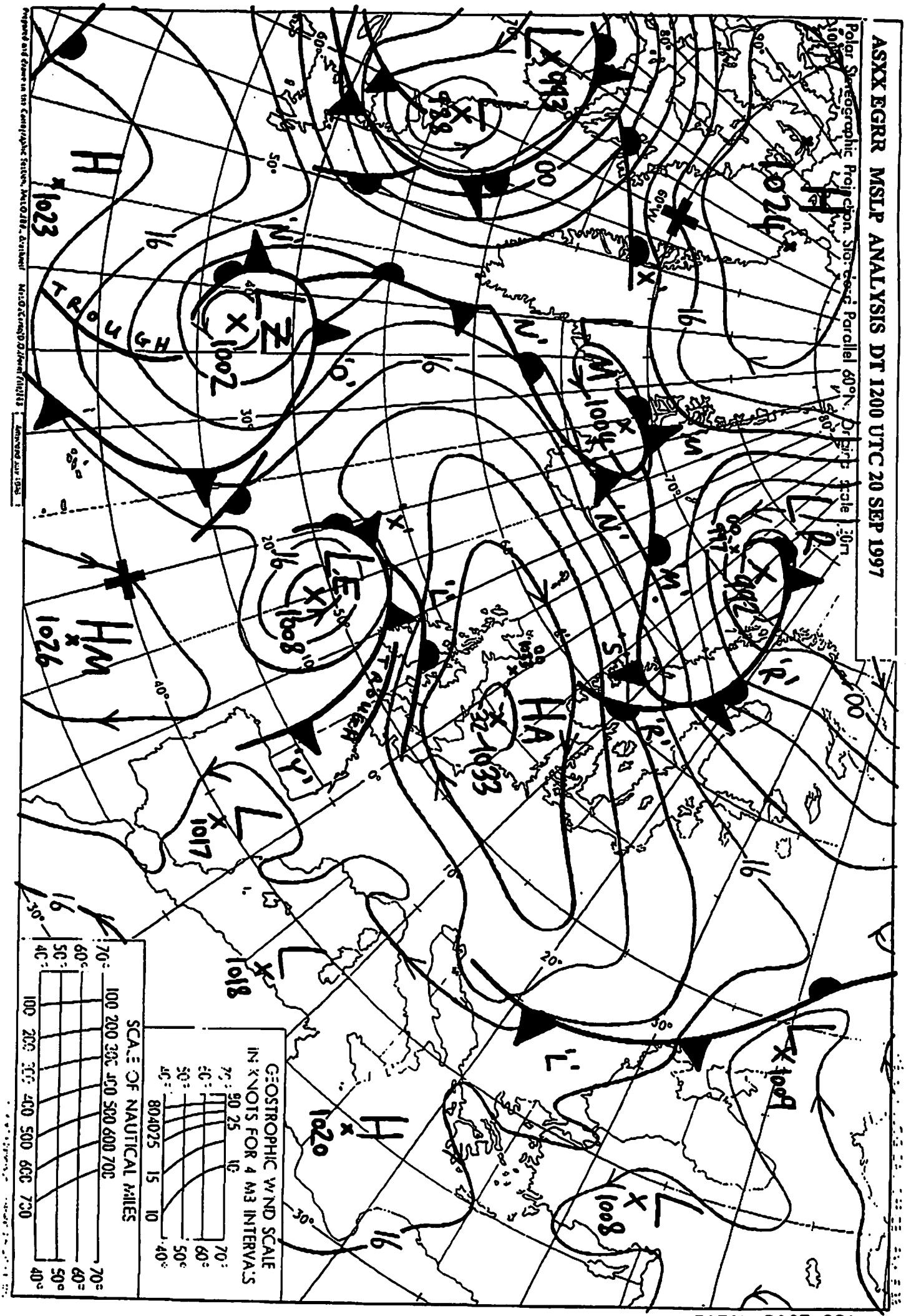
Polar Stereographic Projection. Standard Parallel 60°N. Original scale 1:20m

GEOSTROPHIC WIND SCALE
IN KNOTS FOR 4 MB INTERVALS

80 40 25 15 10

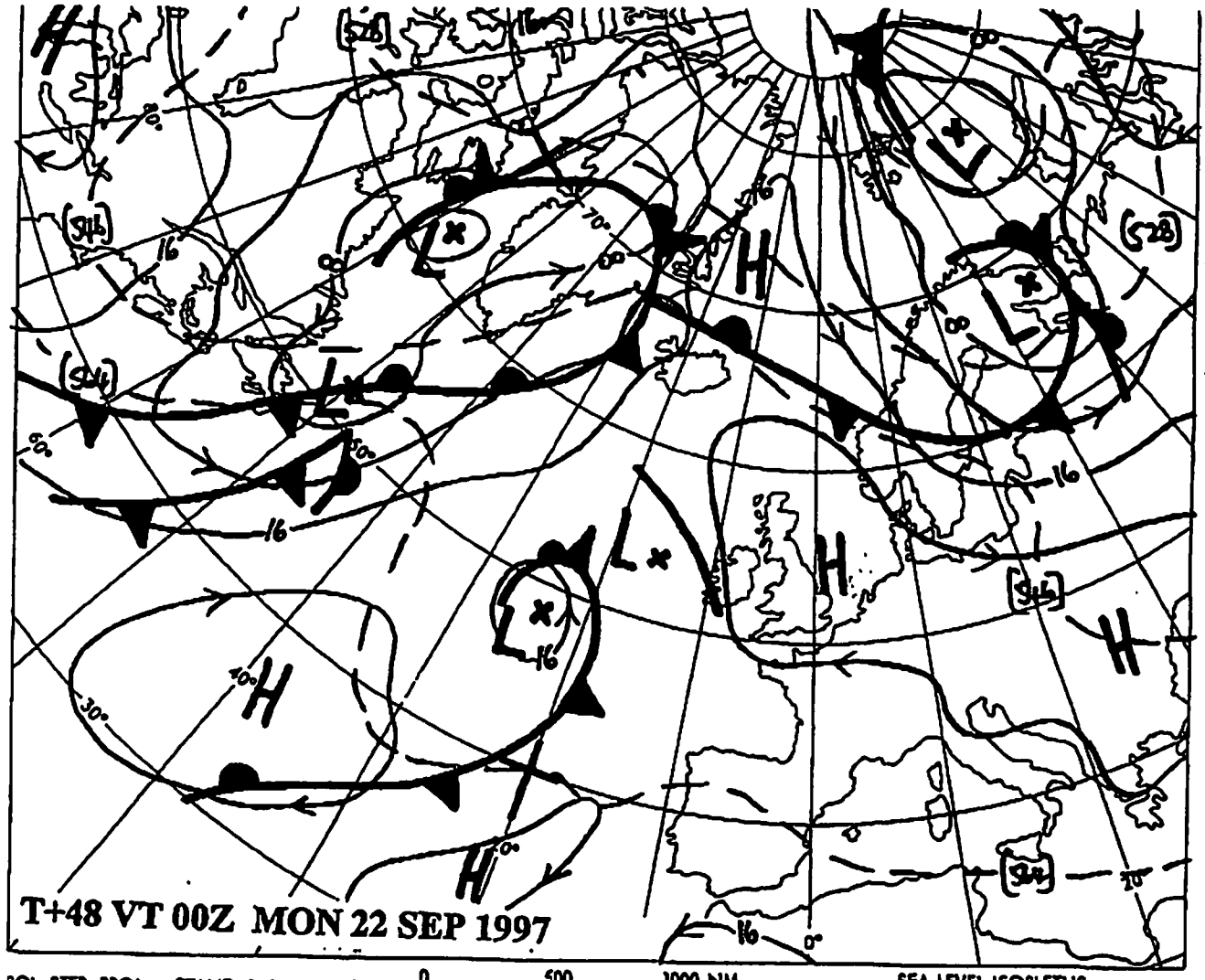
SCALE OF NAUTICAL MILES

100 200 300 400 500 600 700


ASXX EGRR MSLP ANALYSIS DT 1200 UTC 20 SEP 1997
Polar Stereographic Projection. Standard Parallel 60°N. Original scale 1:10m
GEOSTROPHIC WIND SCALE IN KNOTS FOR 4 MB INTERVALS
SCALE OF NAUTICAL MILES

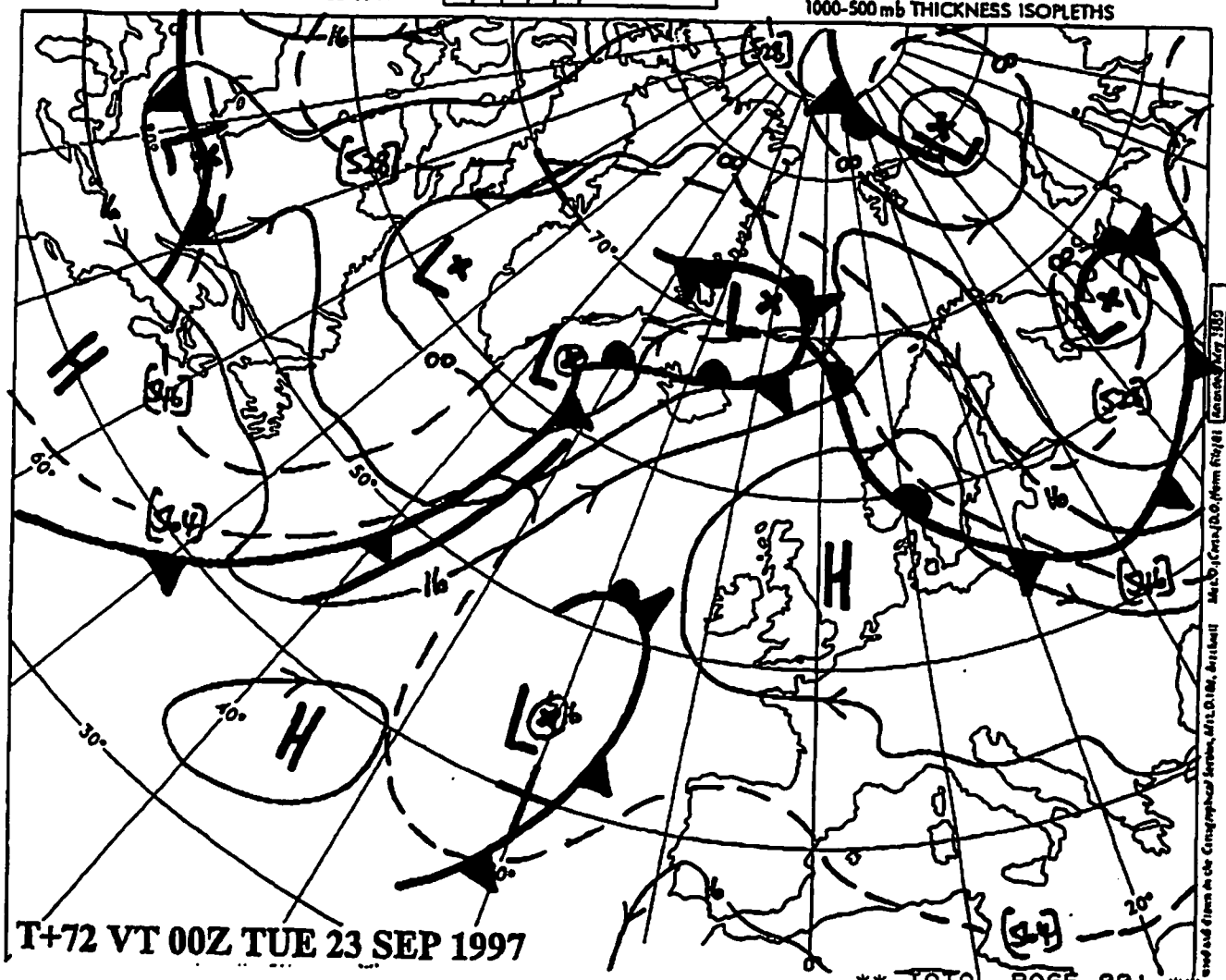
FSXX EGRR 24H MSLP FORECAST VT 0000 UTC 21 SEP 1997
Polar Stereographic Projection. Standard Parallel 60°N Original scale 1:20m
METEOROLOGICAL OFFICE FAX F 28
GEOSTROPHIC WIND SCALE
IN KNOTS FOR 4 MB INTERVALS
80 25 10
80402S 15 10
SCALE OF NAUTICAL MILES
100 200 300 400 500 600 700
70° 60° 50° 40°

FS/FUXX EGRR



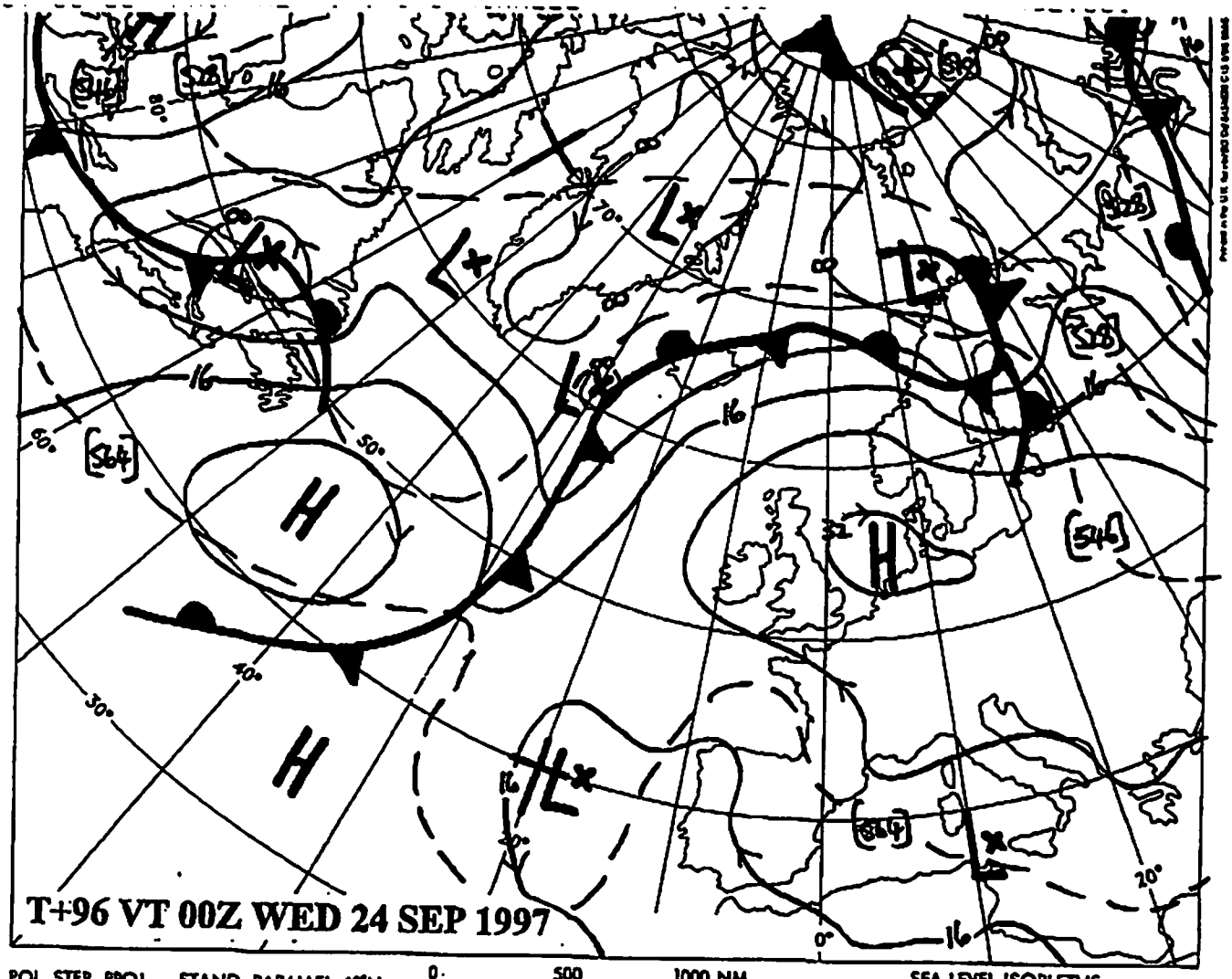
POL STER. PROJ. STAND. PARALLEL 60°N 0 500 1000 NM

SEA LEVEL ISOPLETHS
1000-500 mb THICKNESS ISOPLETHS



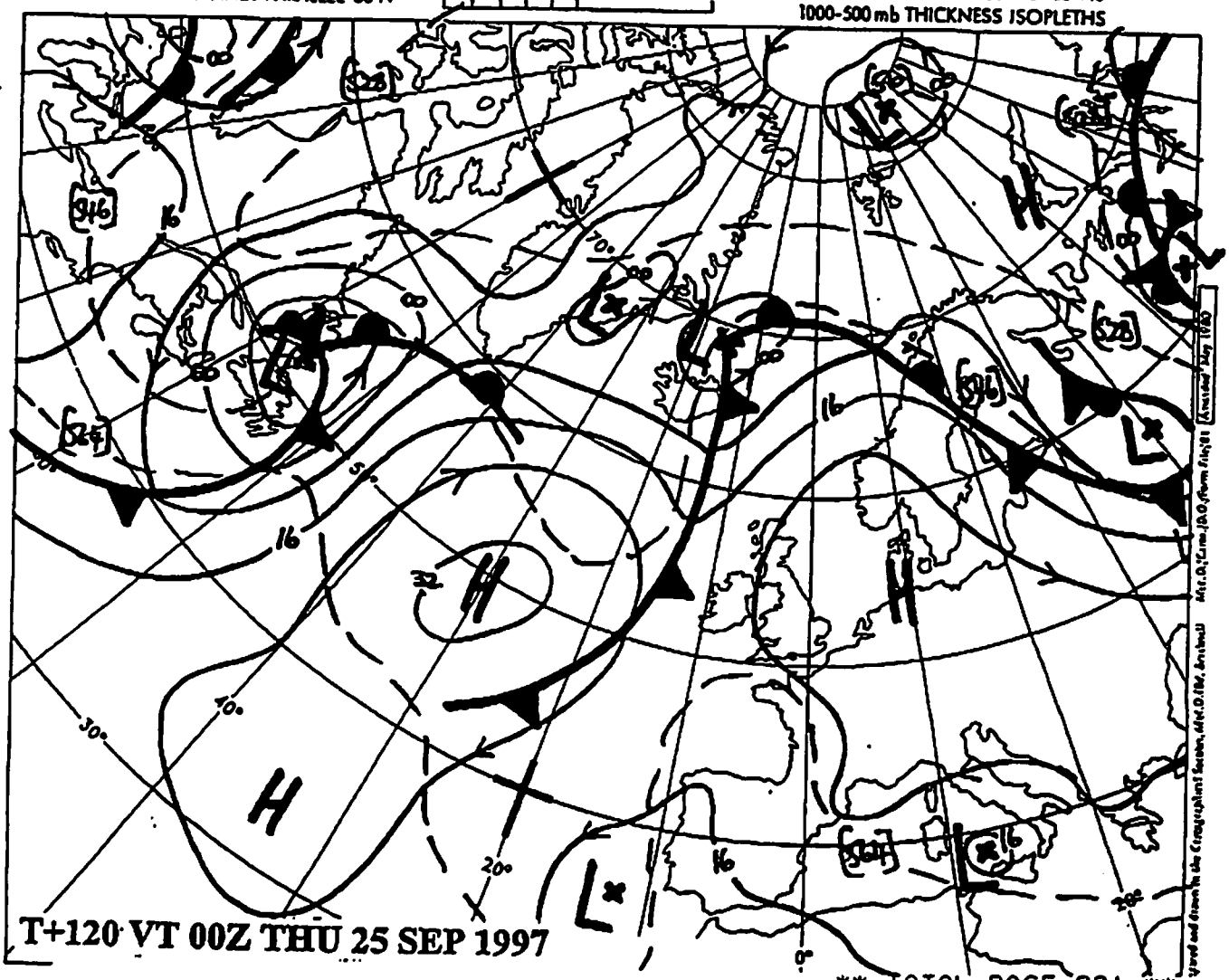
METEOROLOGICAL OFFICE FAX F1

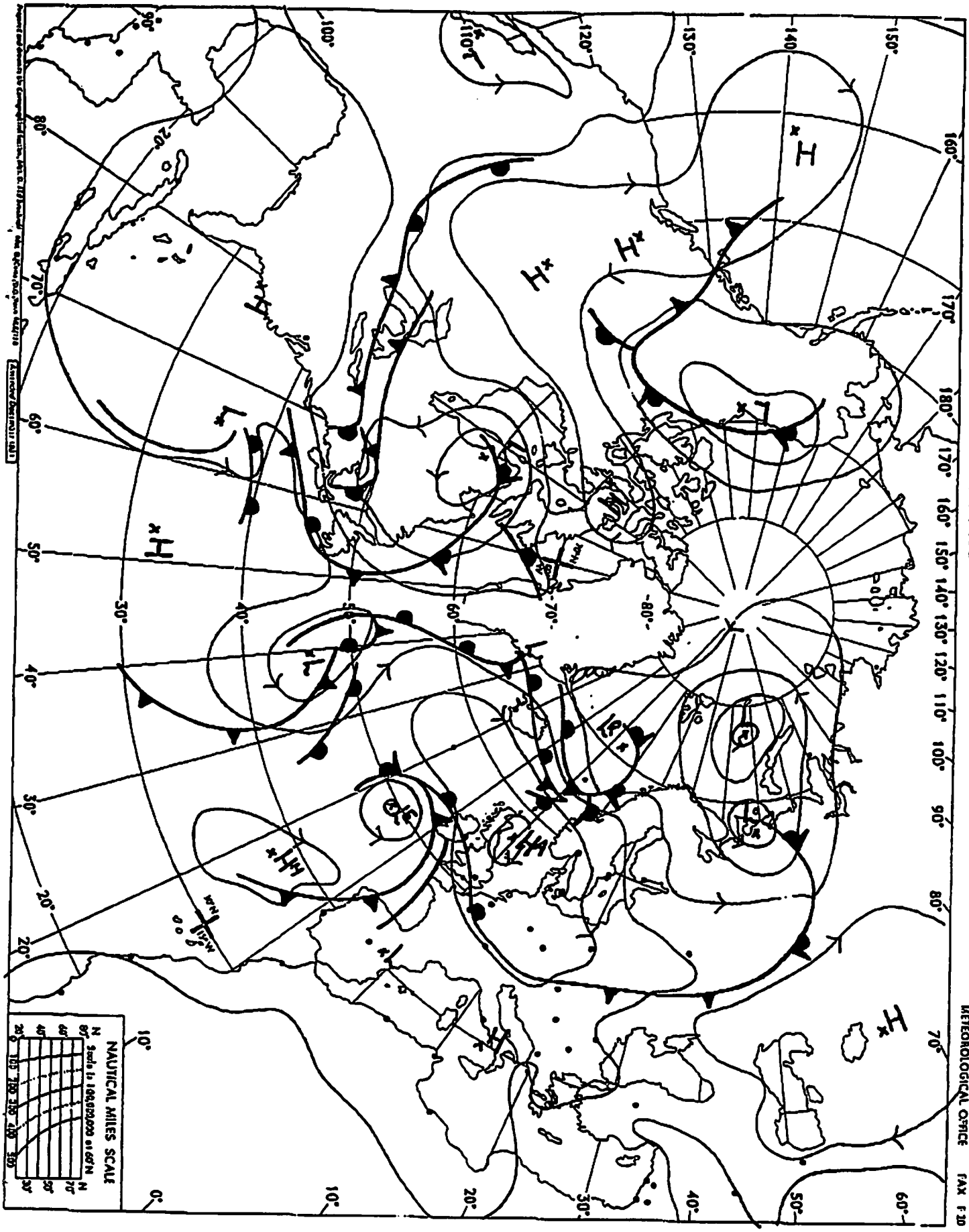
FS/FUXX EGRR



POL. STER. PROJ. STAND. PARALLEL 60°N 0 500 1000 NM

SEA LEVEL ISOPLETHS
1000-500 mb THICKNESS ISOPLETHS

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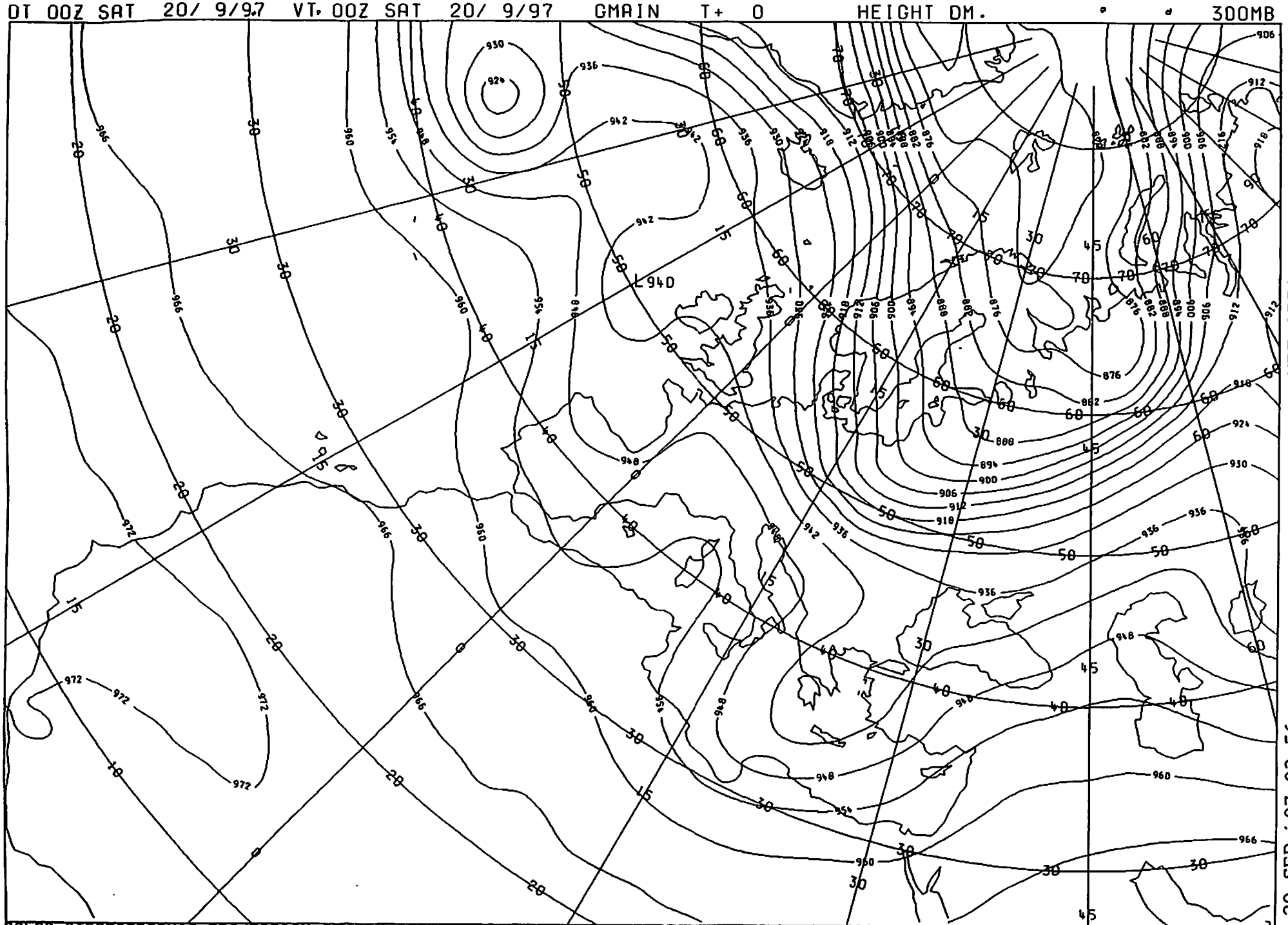
METEOROLOGICAL OFFICE FAX F 30
NAUTICAL MILES SCALE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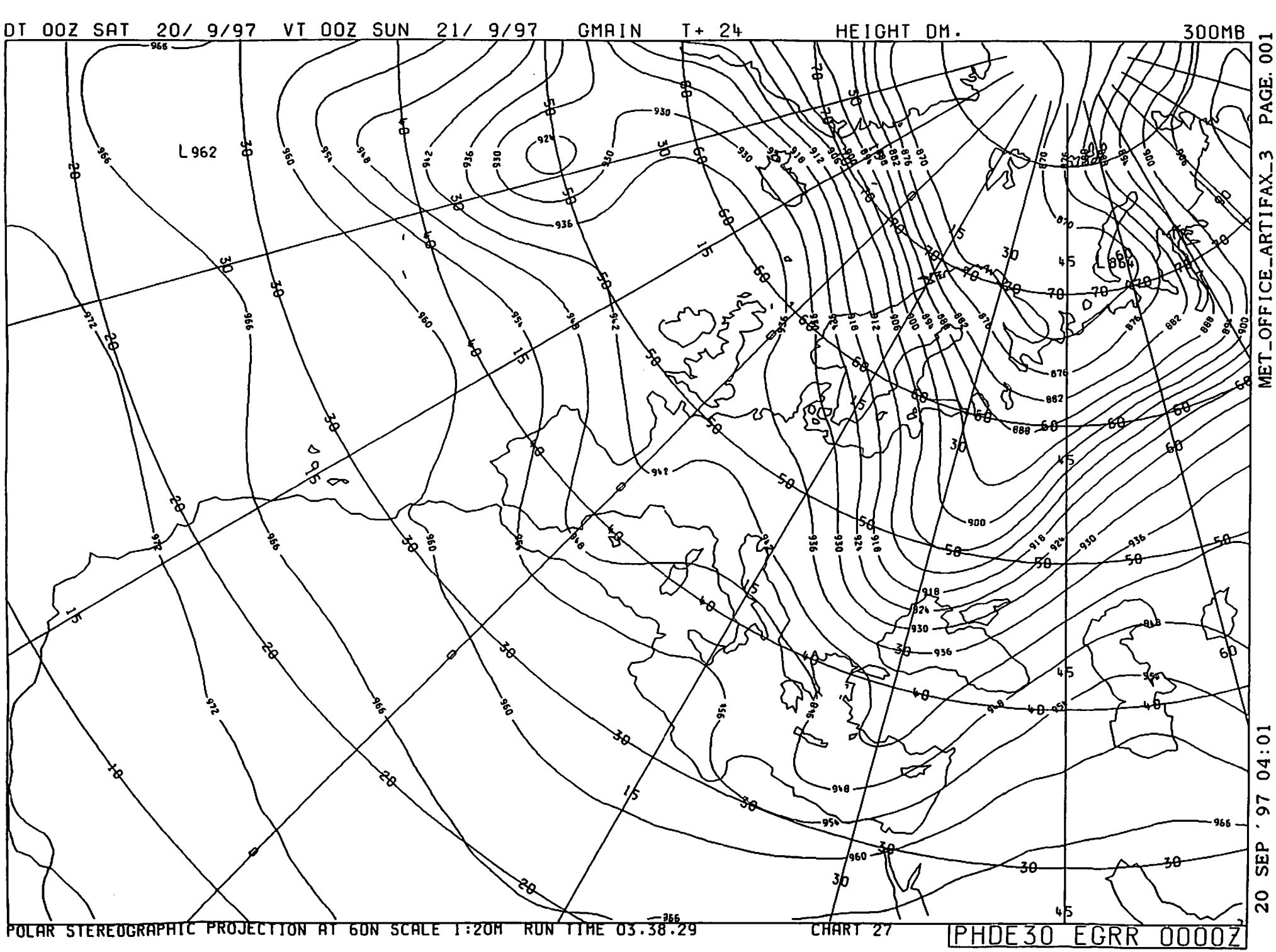
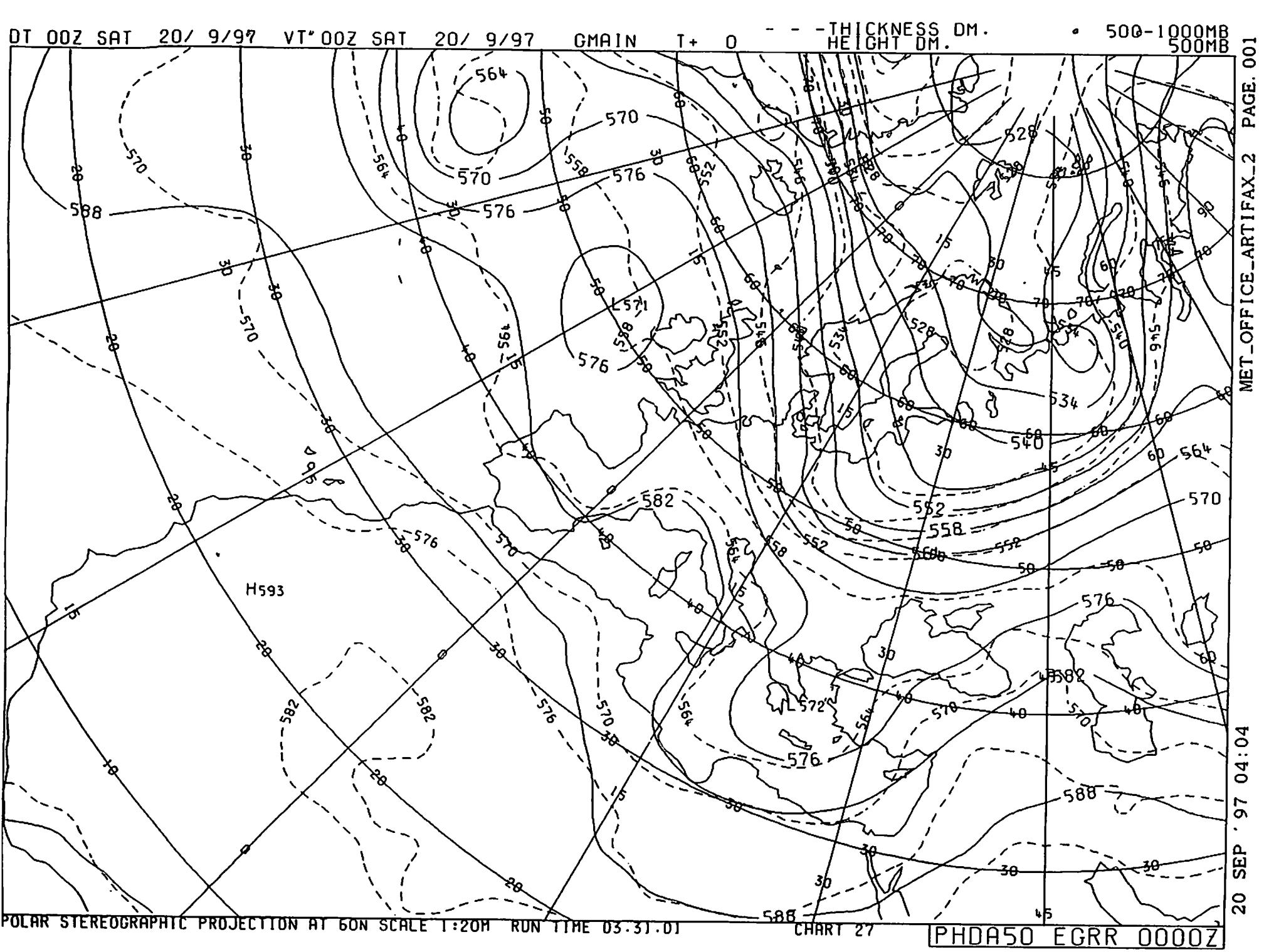
940
POLAR STEREOGRAPHIC PROJECTION AT 60N SCALE 1:20M RUN TIME 03.30.46
CHART 27
PHDA30 EGRR 0000Z
MET_OFFICE_ARTIFAX_1 PAGE. 001
20 SEP '97 03:56


DT 00Z SAT 20/ 9/97 VT 00Z SUN 21/ 9/97 GMAIN T+ 24 HEIGHT DM. 300MB
L962
POLAR STEREOGRAPHIC PROJECTION AT 60N SCALE 1:20M RUN TIME 03.38.29
CHART 27
PHDE30 EGRR 0000Z
20 SEP '97 04:01
MET_OFFICE_ARTIFAX_3 PAGE. 001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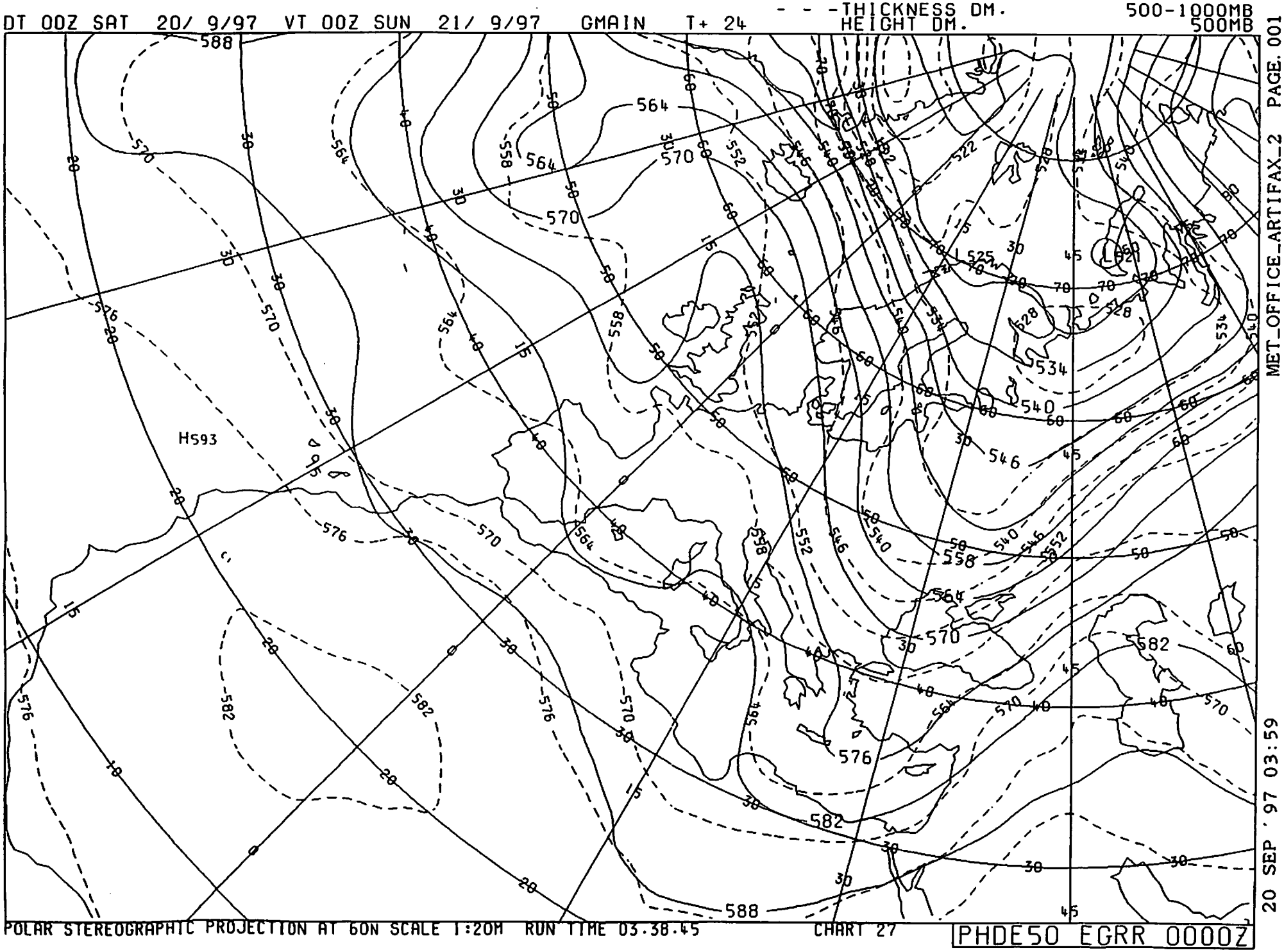
THICKNESS DM.
HEIGHT DM.
500-1000MB
500MB
MET_OFFICE_ARTIFAX_2 PAGE 001
20 SEP '97 04:04
H593
L571
L572
POLAR STEREOGRAPHIC PROJECTION AT 60N SCALE 1:20M RUN TIME 03.31.01
CHART 27
PHDA50 EGRR 0000Z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- - - -THICKNESS DM.
HEIGHT DM.
500-1000MB
500MB
MET_OFFICE_ARTIFAX_2 PAGE. 001
20 SEP '97 03:59
H593
L521
POLAR STEREOGRAPHIC PROJECTION AT 60N SCALE 1:20M RUN TIME 03.38.45
CHART 27
PHDE50 EGRR 0000Z

SNOW PROBABILITY AT MSL
TOTAL PPN RATE
PRESSURE AT MSL

DT 00Z SATURDAY 20/9/1997 LMAIN

.03 .1 .5 1.0 MM/HR AT VT
SNOW
CONVECTIVE
DYNAMIC

T+0 VT 0Z SATURDAY 20/9/1997

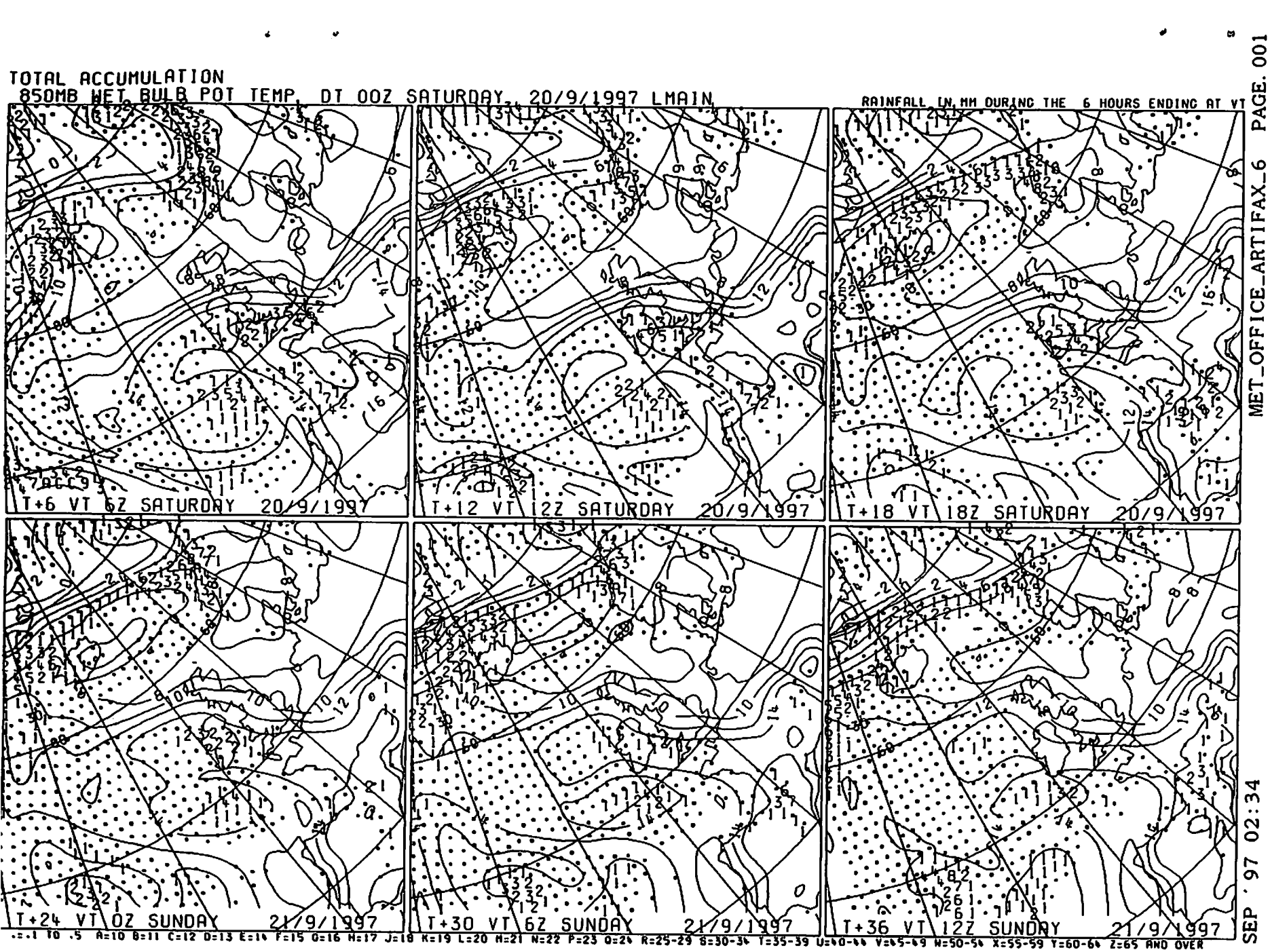
MET_OFFICE_ARTIFAX_1 PAGE. 001

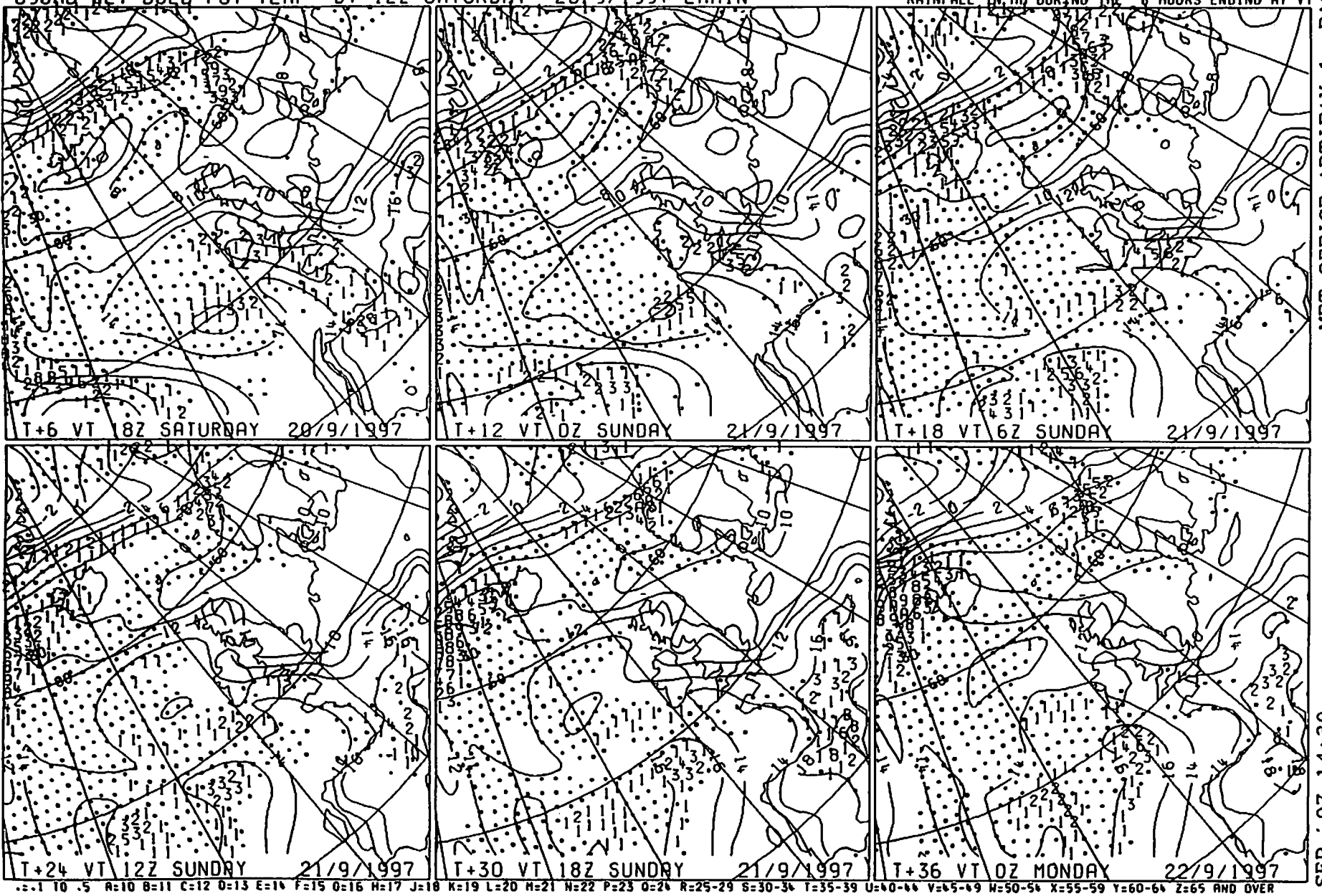
20 SEP '97 03:33

SNOW PROBABILITY AT MSL
TOTAL PPN RATE
PRESSURE AT MSL
DT 00Z SATURDAY 20/9/1997 LMAIN
T+12 VT 12Z SATURDAY 20/9//1997
SNOW
CONVECTIVE
DYNAMIC
.03
.1
.5
4.0
MM/HR AT VT

SNOW PROBABILITY AT MSL
TOTAL PPN RATE
PRESSURE AT MSL
DT OOZ SATURDAY 20/9/1997 LMAIN
SNOW
CONVECTIVE
DYNAMIC
.03 .1 .5 1.0 MM/HR AT VT
T+24 VT OZ SUNDAY 21/9/1997
20 SEP '97 03:35
MET_OFFICE_ARTIFAX_1 PAGE. 001

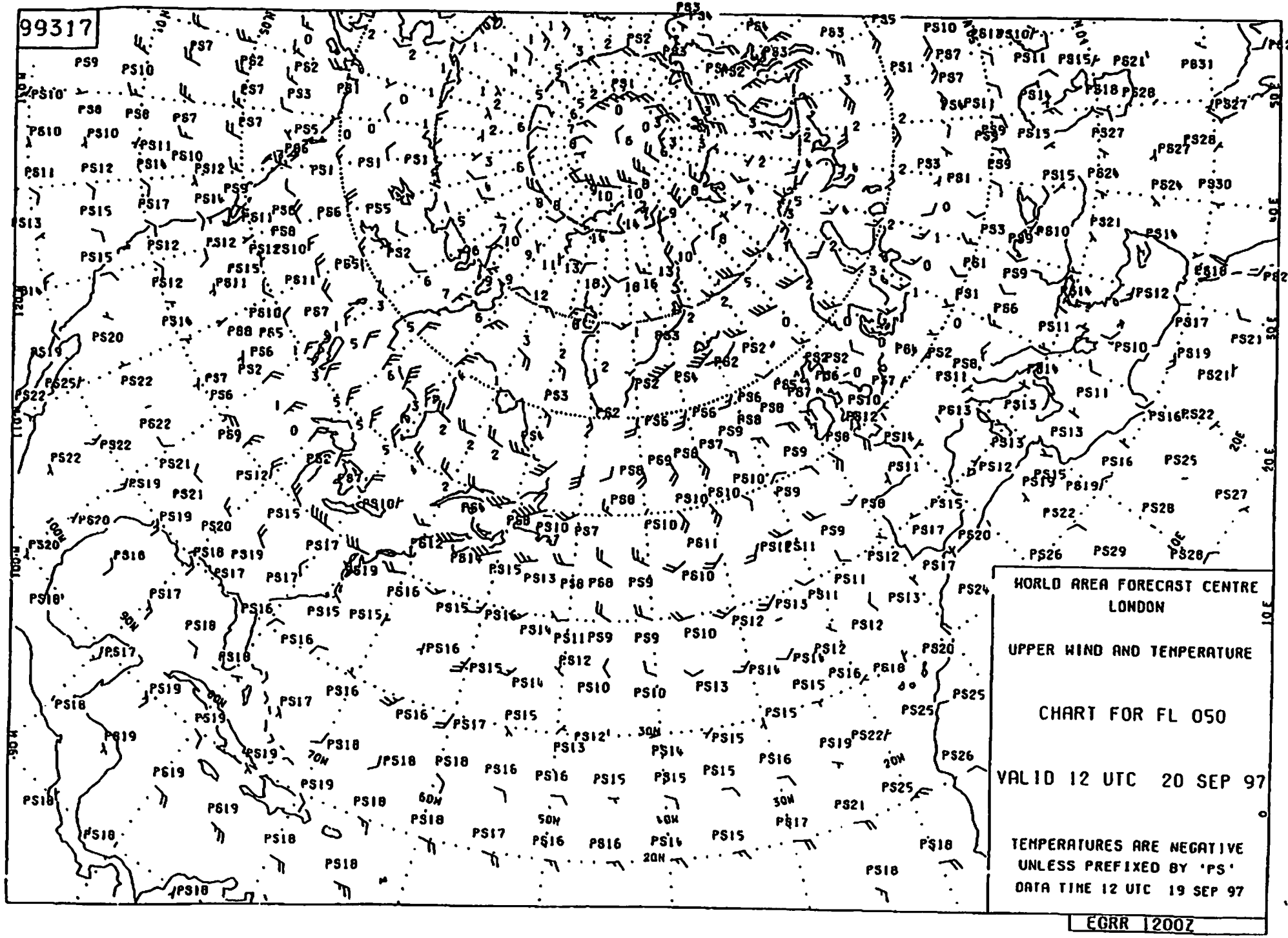
T+36 VT 12Z SUNDAY 21/9/1997
SNOW PROBABILITY AT MSL
TOTAL PPN RATE
PRESSURE AT MSL
00 00Z SATURDAY 20/9/1997 LMAIN
SNOW
CONVECTIVE
DYNAMIC
.03 .1 .5 1.0 MM/HR AT VT

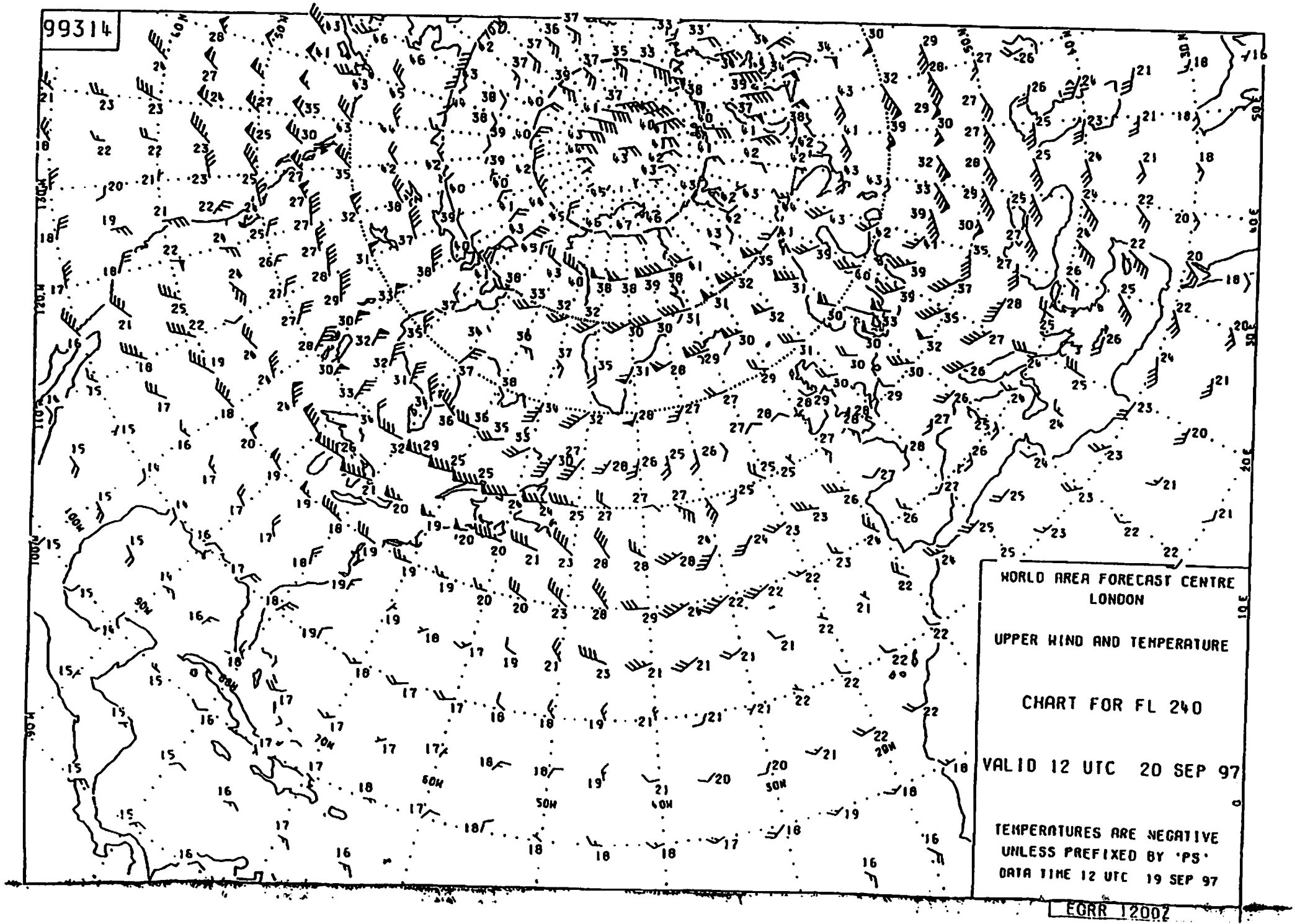


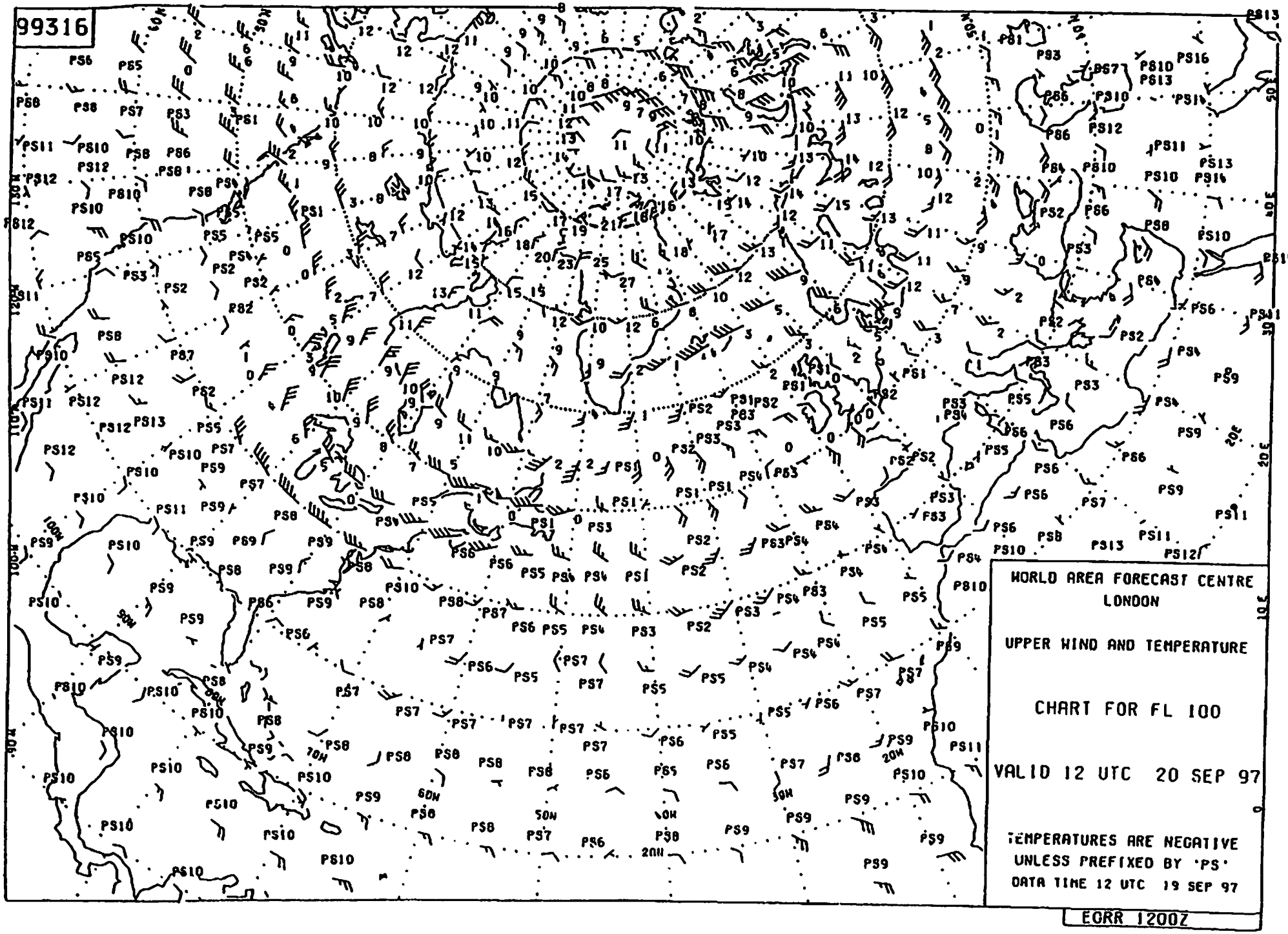


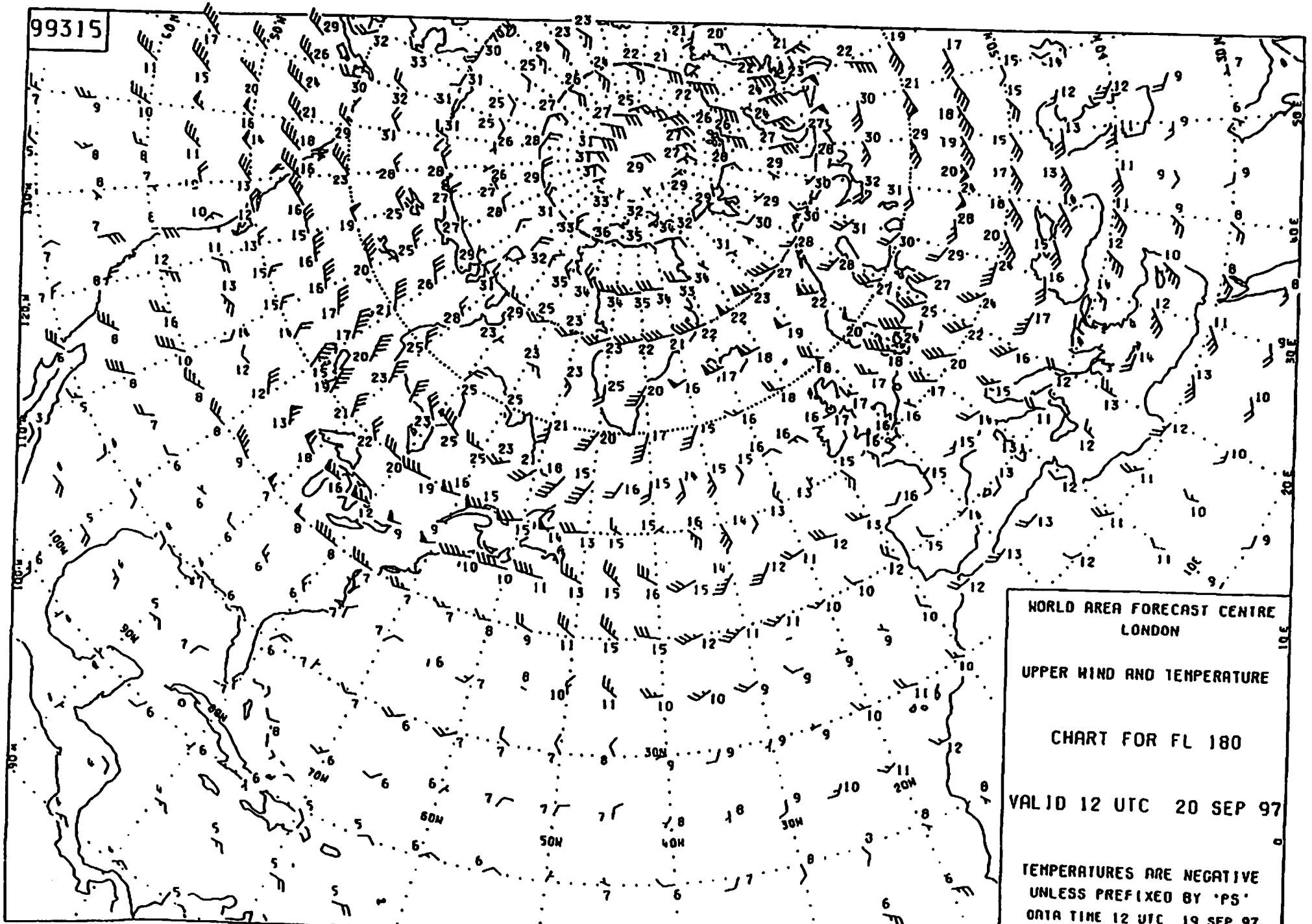
SNOW PROBBILITY AT MSL
TOTAL PPN RATE
PRESSURE AT MSL
T+6 VT 6Z SATURDAY 20/9/1997
T+12 VT 12Z SATURDAY 20/9/1997
T+18 VT 18Z SATURDAY 20/9/1997
T+24 VT 0Z SUNDAY 21/9/1997
T+30 VT 6Z SUNDAY 21/9/1997
T+36 VT 12Z SUNDAY 21/9/1997
SNOW
CONVECTIVE
DYNAMIC
MM/HR AT VT
.03 .1 .5 1.0
0T 00Z SATURDAY 20/9/1997 LMAIN
20 SEP '97 02:40
MET_OFFICE_ARTIFAX_4 PAGE. 001

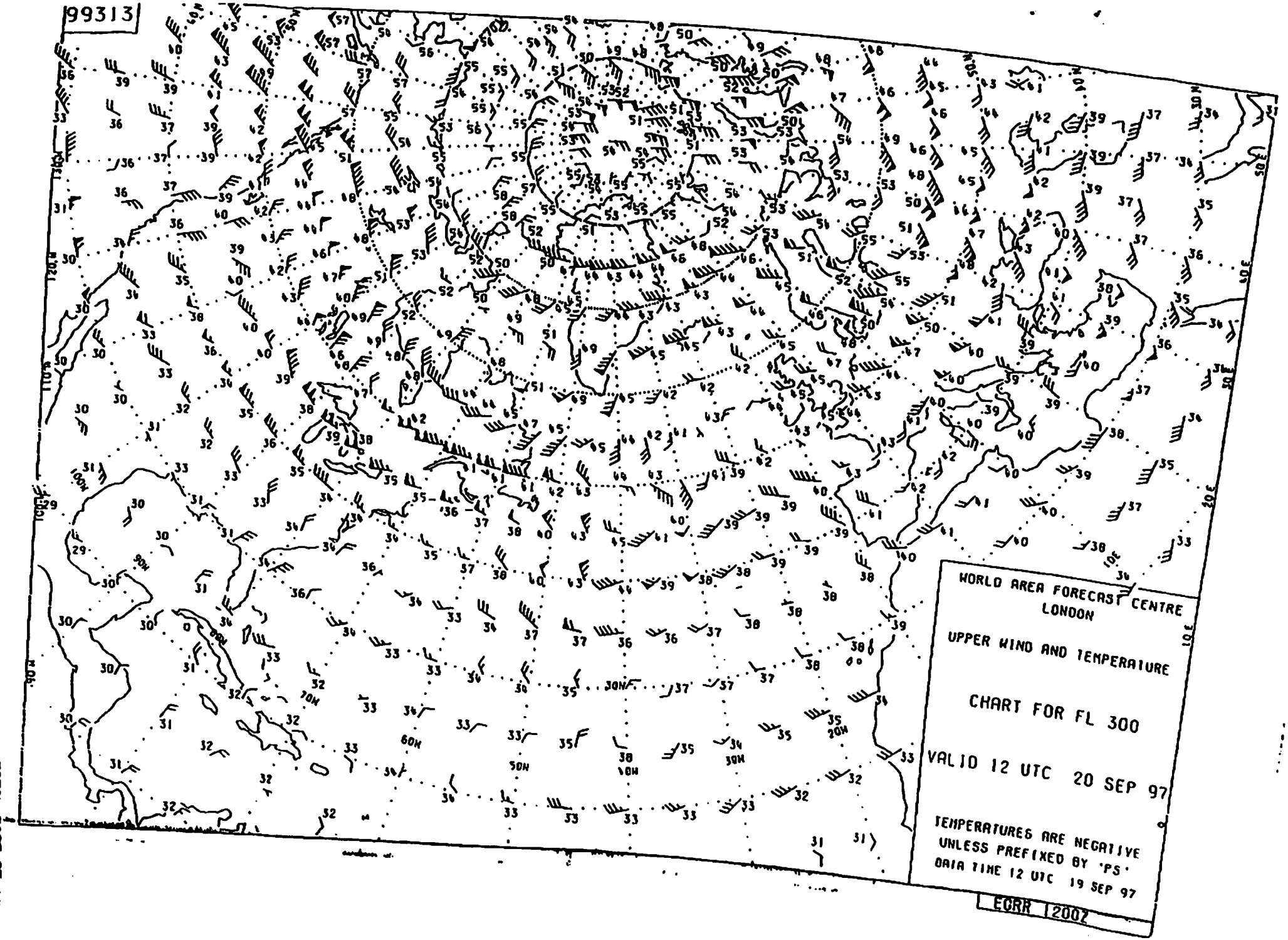
SNOW PROBABILITY AT MSL
TOTAL PPN RATE
PRESSURE AT MSL
T+6 VT 18Z SATURDAY 20/9/1997
T+12 VT 00Z SUNDAY 21/9/1997
T+18 VT 06Z SUNDAY 21/9/1997
T+24 VT 12Z SUNDAY 21/9/1997
T+30 VT 18Z SUNDAY 21/9/1997
T+36 VT 00Z MONDAY 22/9/1997
01 12Z SATURDAY 20/9/1997 LMAIN
SNOW CONVECTIVE DYNAMIC
.03 .1 .5 1.0 MM/HR AT VT
20 SEP '97 14:33
MET_OFFICE_ARTIFAX_5 PAGE. 001


99317
WORLD AREA FORECAST CENTRE
LONDON
UPPER WIND AND TEMPERATURE
CHART FOR FL 050
VALID 12 UTC 20 SEP 97
TEMPERATURES ARE NEGATIVE
UNLESS PREFIXED BY 'PS'
DATA TIME 12 UTC 19 SEP 97
EGRR 1200Z

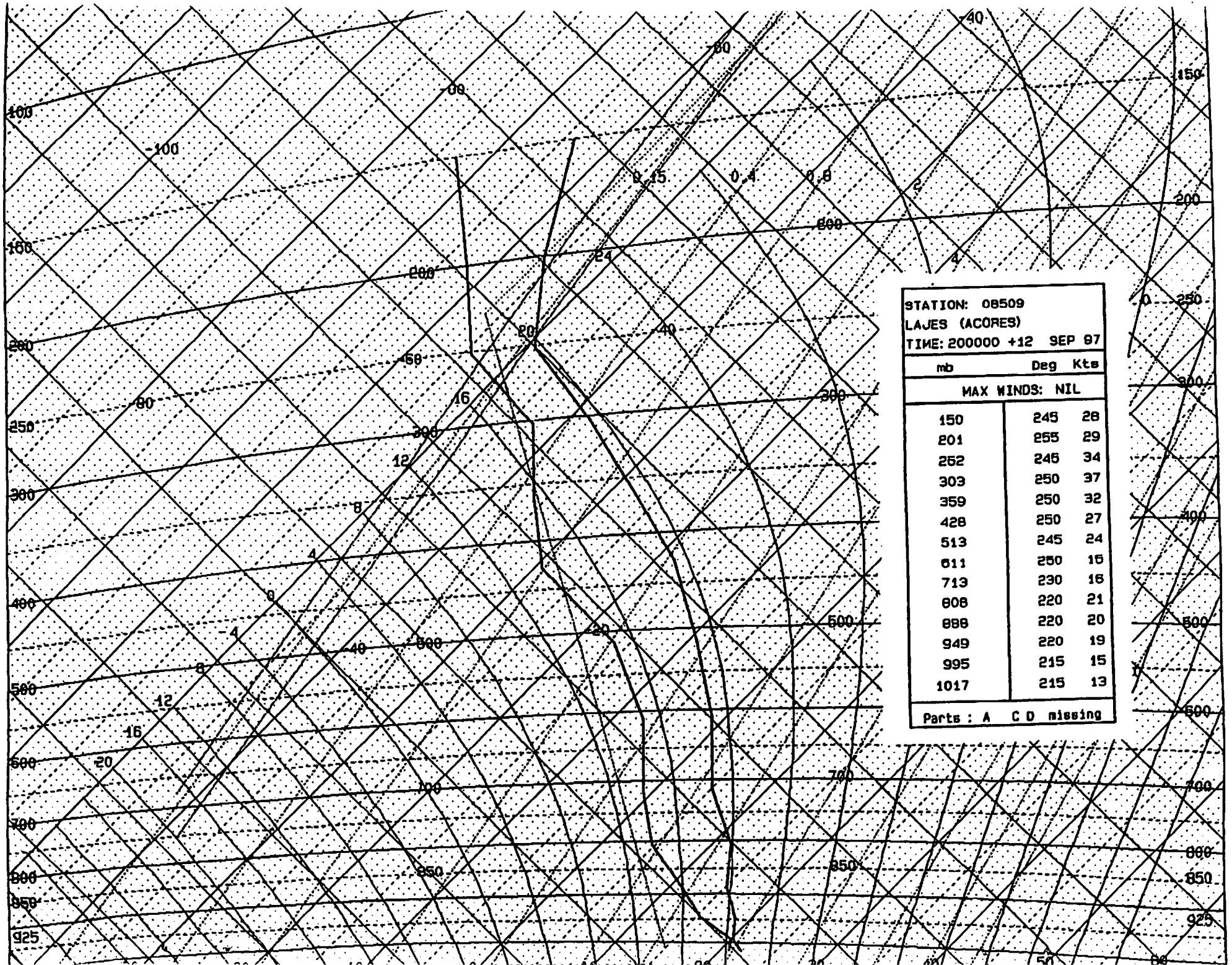

99314
WORLD AREA FORECAST CENTRE
LONDON
UPPER WIND AND TEMPERATURE
CHART FOR FL 240
VALID 12 UTC 20 SEP 97
TEMPERATURES ARE NEGATIVE
UNLESS PREFIXED BY 'PS'
DATA TIME 12 UTC 19 SEP 97
EGRR 12007

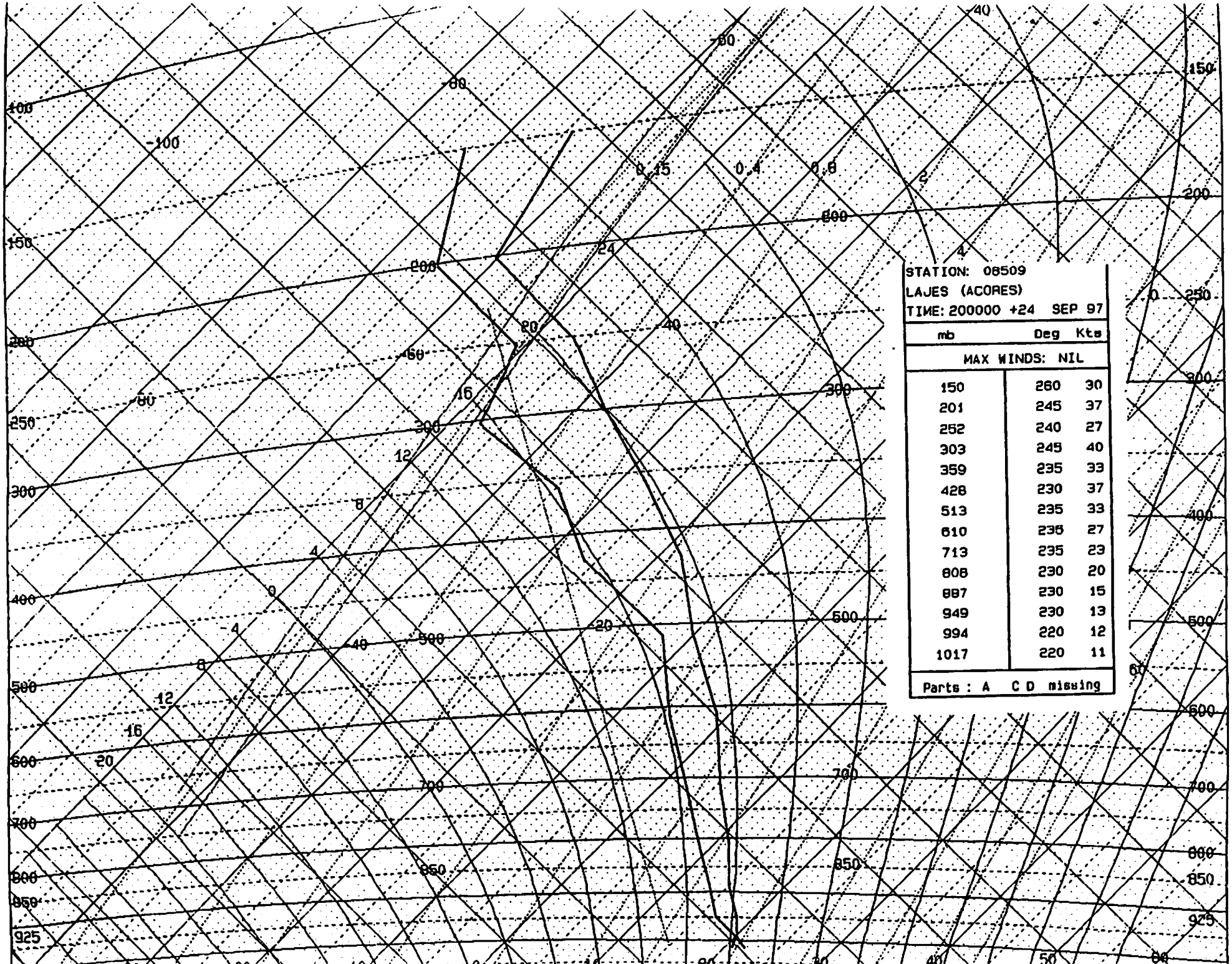

99316
WORLD AREA FORECAST CENTRE
LONDON
UPPER WIND AND TEMPERATURE
CHART FOR FL 100
VALID 12 UTC 20 SEP 97
TEMPERATURES ARE NEGATIVE
UNLESS PREFIXED BY 'PS'
DATA TIME 12 UTC 19 SEP 97
EGRR 1200Z

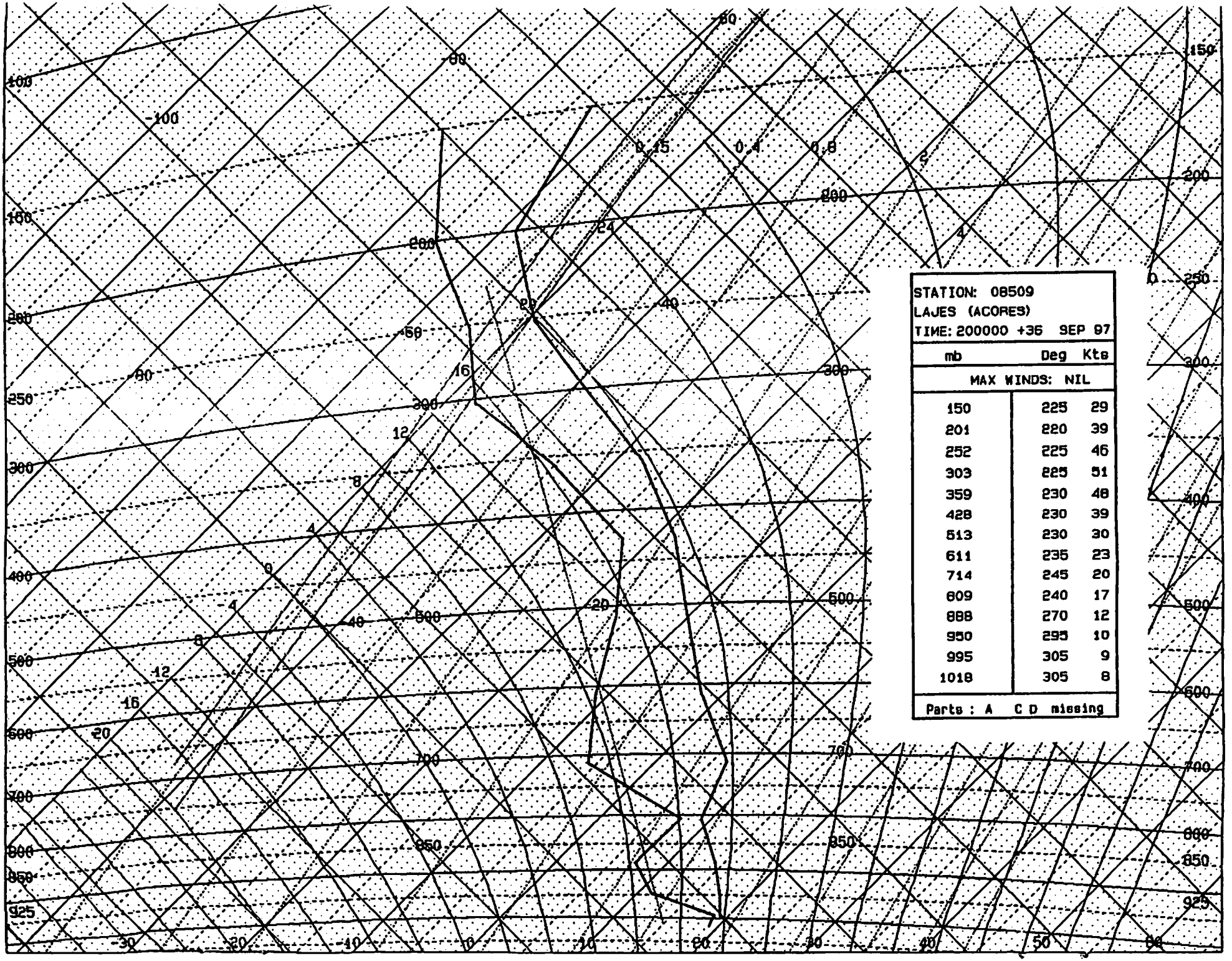

99315
WORLD AREA FORECAST CENTRE
LONDON
UPPER WIND AND TEMPERATURE
CHART FOR FL 180
VALID 12 UTC 20 SEP 97
TEMPERATURES ARE NEGATIVE
UNLESS PREFIXED BY 'PS'
DATA TIME 12 UTC 19 SEP 97
EGRR 12007



** TOTAL PAGE.05 **

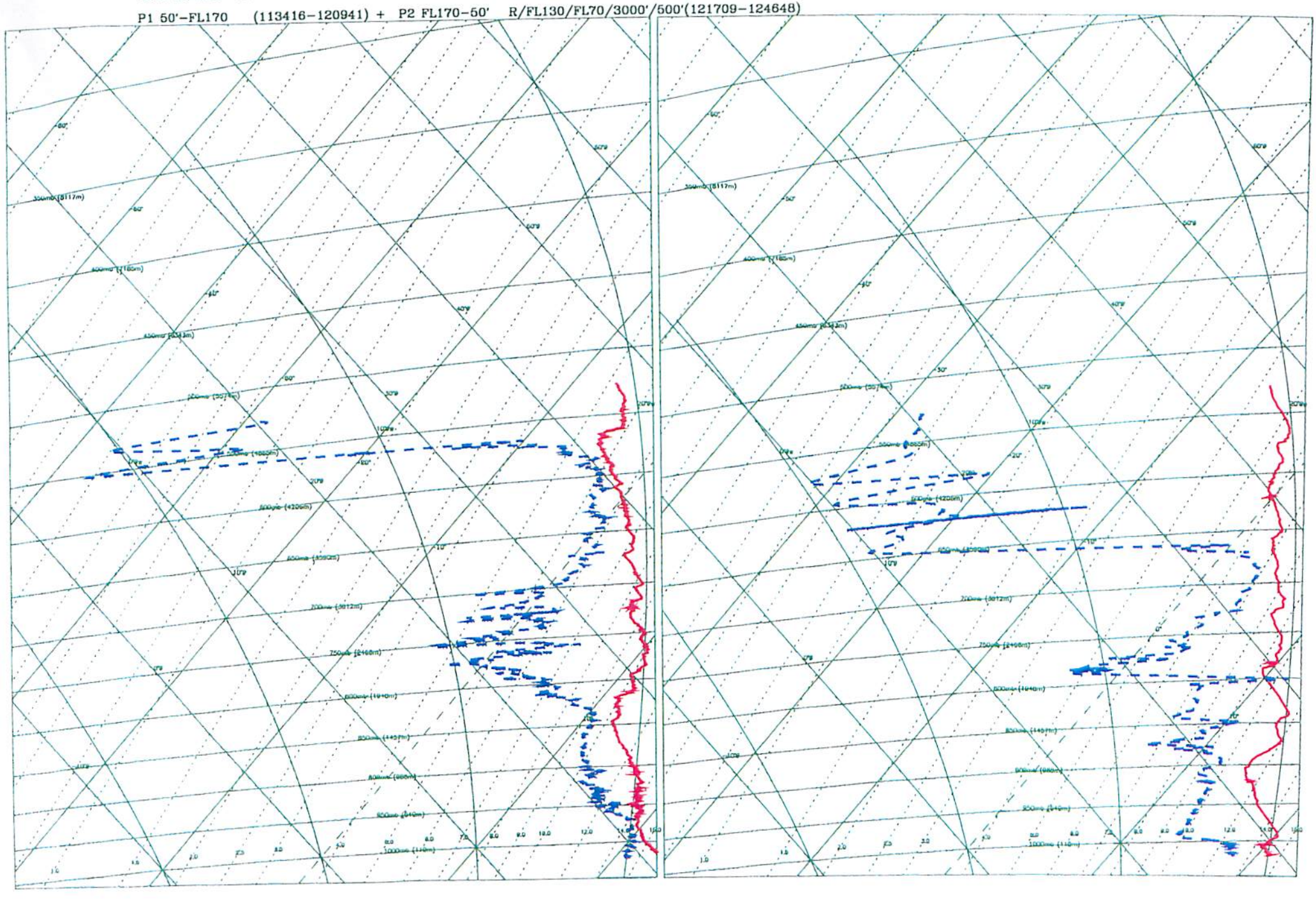

STATION: 08509
LAJES (ACORES)
TIME: 200000 +12 SEP 97
mb Deg Kts
MAX WINDS: NIL
150 245 28
201 255 29
252 245 34
303 250 37
359 250 32
428 250 27
513 245 24
611 250 16
713 230 16
808 220 21
888 220 20
949 220 19
995 215 15
1017 215 13
Parts : A C D missing


STATION: 08509
LAJES (ACORES)
TIME: 200000 +24 SEP 97
mb Deg Kts
MAX WINDS: NIL
150 260 30
201 245 37
252 240 27
303 245 40
359 235 33
428 230 37
513 235 33
610 235 27
713 235 23
808 230 20
887 230 15
949 230 13
994 220 12
1017 220 11
Parts : A C D missing


STATION: 08509
LAJES (ACORES)
TIME: 200000 +36 SEP 97
mb Deg Kts
MAX WINDS: NIL
150 225 29
201 220 39
252 225 46
303 225 51
359 230 48
428 230 39
513 230 30
611 235 23
714 245 20
809 240 17
888 270 12
950 295 10
995 305 9
1018 305 8
Parts : A C D missing

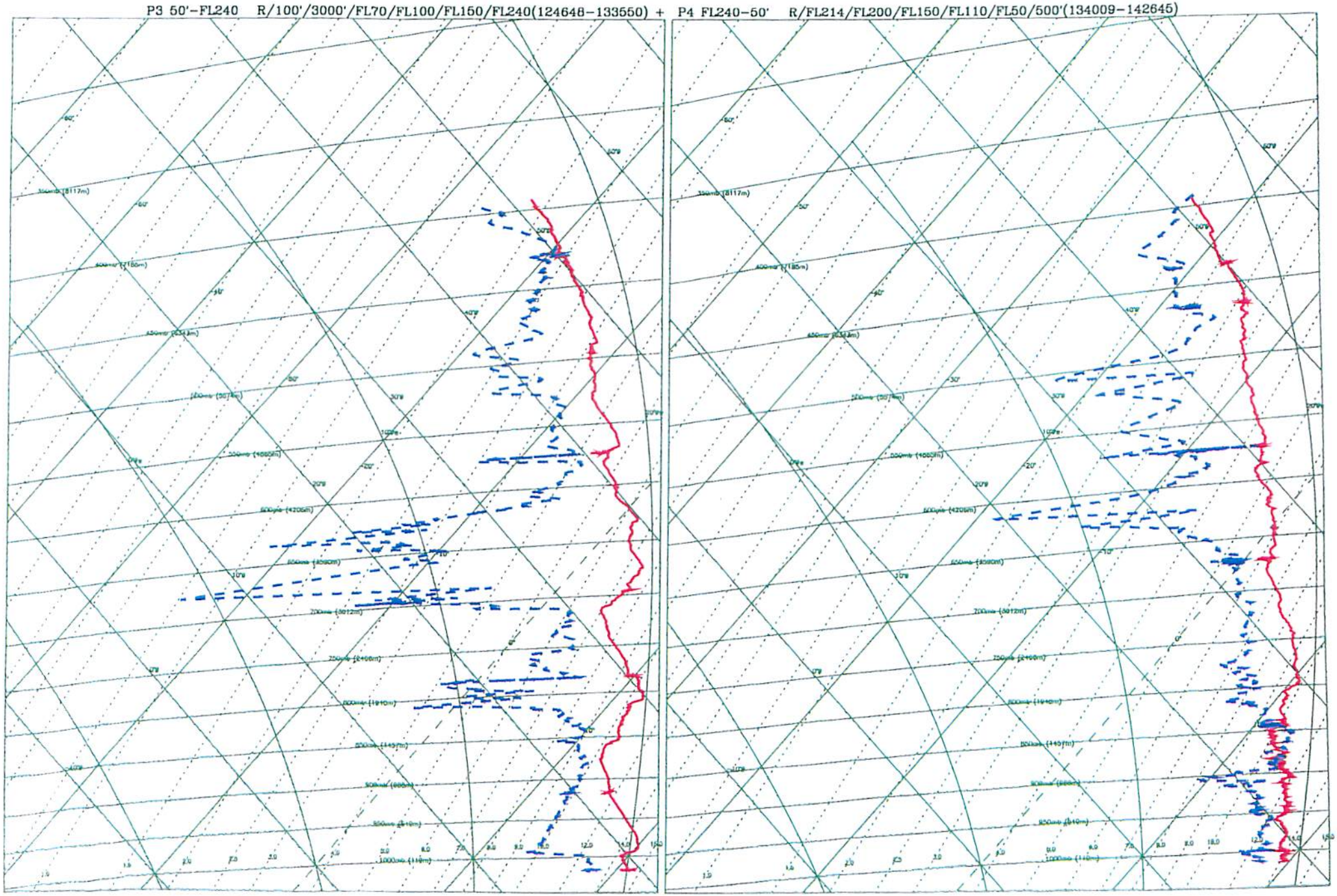
A579 20-SEP-97

P1 50'-FL170 (113416-120941) + P2 FL170-50' R/FL130/FL70/3000'/500'(121709-124648)



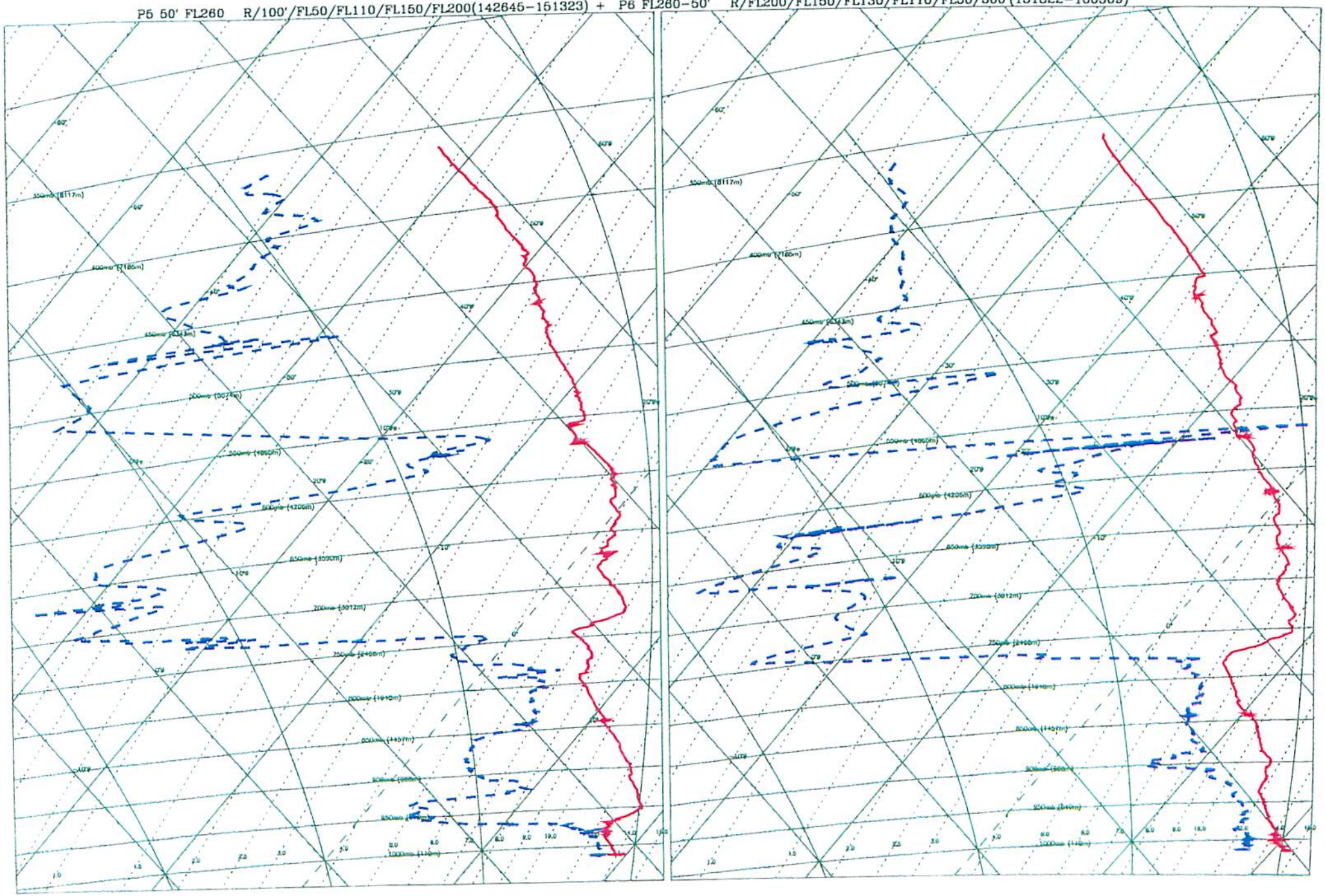
A579 20-SEP-97

P3 50'-FL240 R/100'/3000'/FL70/FL100/FL150/FL240(124648-133550) + P4 FL240-50' R/FL214/FL200/FL150/FL110/FL50/500'(134009-142645)



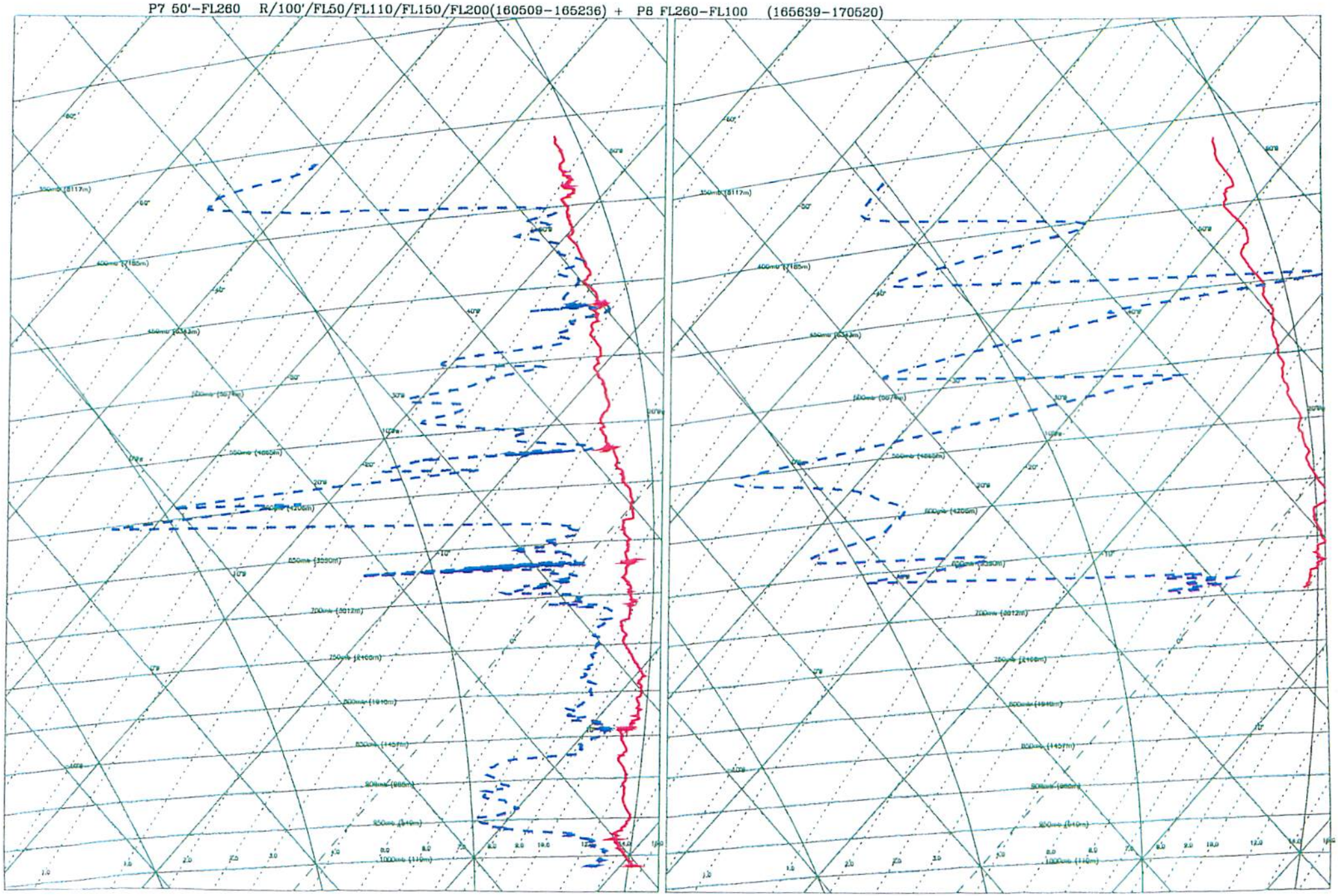
A579 20-SEP-97

P5 50' FL260 R/100'/FL50/FL110/FL150/FL200(142645-151323) + P6 FL260-50' R/FL200/FL150/FL130/FL110/FL50/500'(151822-160509)

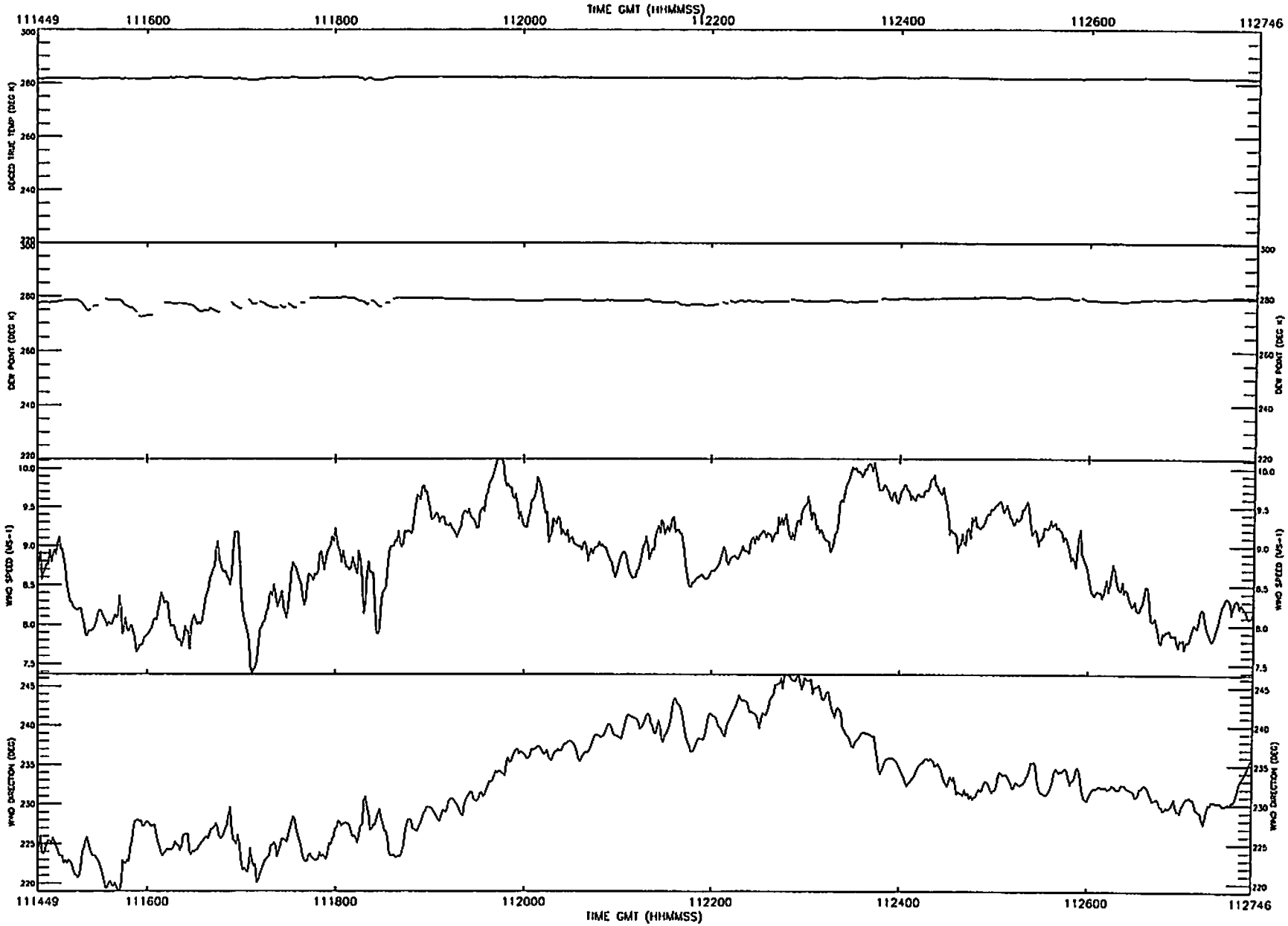


A579 20-SEP-97

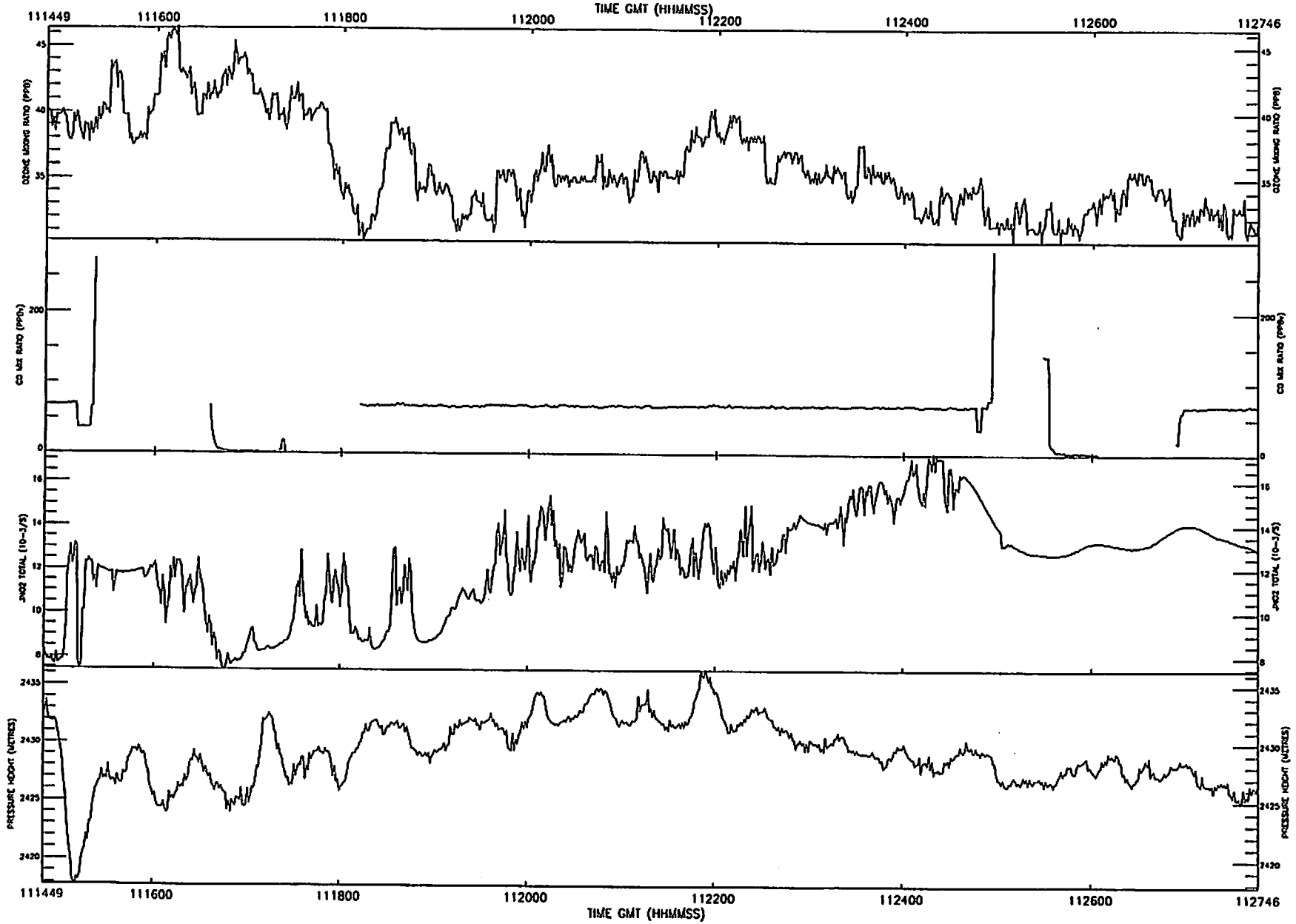
P7 50'-FL260 R/100'/FL50/FL110/FL150/FL200(160509-165236) + P8 FL260-FL100 (165639-170520)



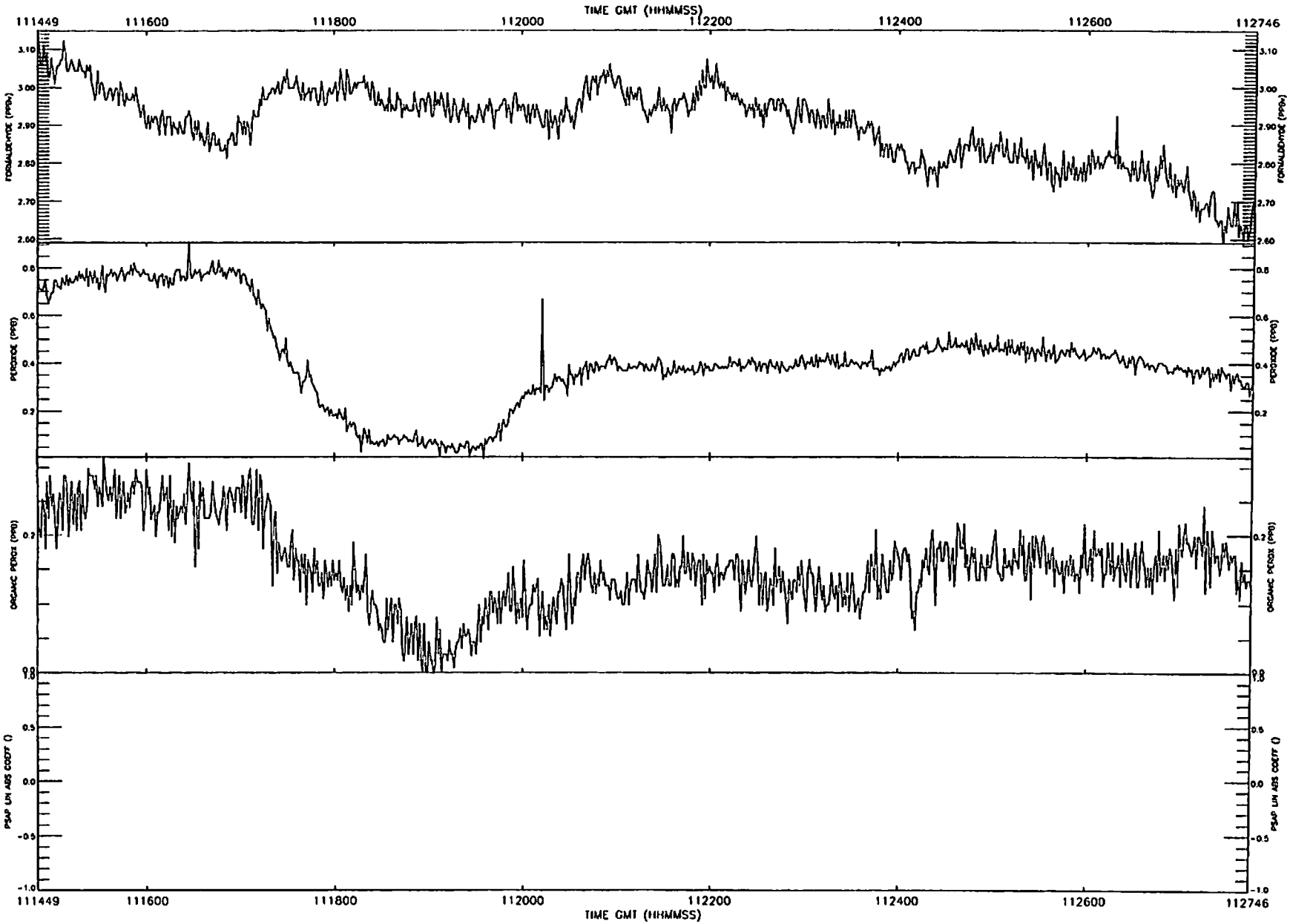
A579 20-SEP-97 R1 FL80 From 111449-112746 *Plotted 7-May-1998 09:26*



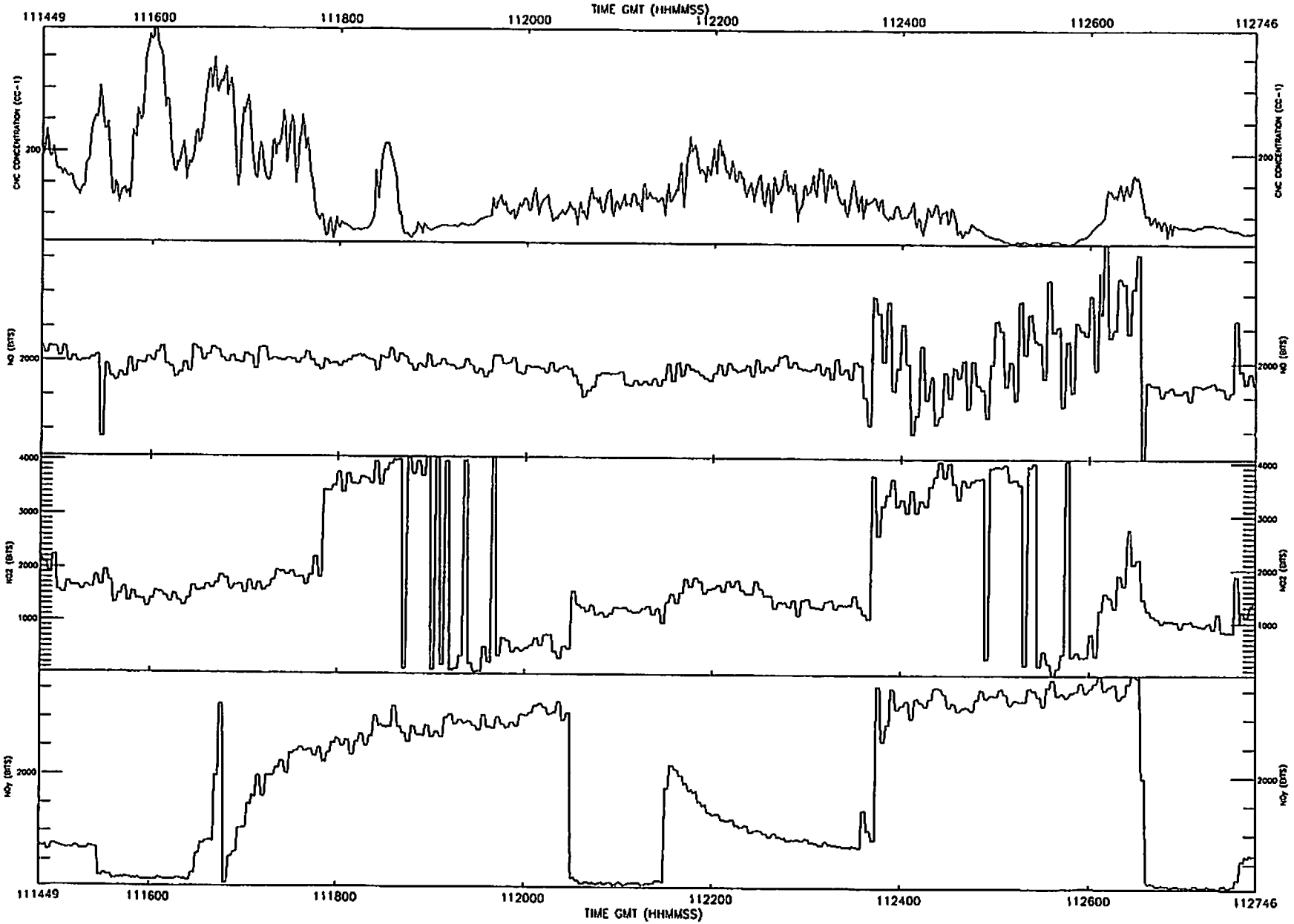
A579 20-SEP-97 R1 FL80 From 111449-112746 *Plotted 7-May-1998 09:26*



A579 20-SEP-97 R1 FL80 From 111449-112746 *Plotted* 7-May-1998 09:26



A579 20-SEP-97 R1 FL80 From 111449-112746 *Plotted 7-May-1998 09:26*



STATIC PRESSURE (MB)
No of obs 778
Mean 753.487
Standard dev 0.269563
Max value 754.566
Min value 752.813

DEICED TRUE TEMP (DEG K)
No of obs 778
Mean 282.027
Standard dev 0.197520
Max value 282.468
Min value 281.266

DEW POINT (DEG K)
No of obs 778
Mean 278.321
Standard dev 1.30764
Max value 280.031
Min value 272.440

OZONE MIXING RATIO (PPB)
No of obs 778
Mean 35.9164
Standard dev 3.52234
Max value 46.3748
Min value 30.2248

PSAP LIN ABS COEFF ()
No of obs 778
Mean 1.000000e-38
Standard dev 0.000000
Max value 1.000000e-38
Min value 1.000000e-38

JNO2 TOTAL (10-3/S)
No of obs 778
Mean 12.3179
Standard dev 2.20167
Max value 17.2842
Min value 7.43844

PRESSURE HEIGHT (METRES)
No of obs 778
Mean 2429.22
Standard dev 2.85182
Max value 2436.36
Min value 2417.81

CORRECTED LATITUDE (DEGREES)
No of obs 778
Mean 37.1969
Standard dev 8.482909e-02
Max value 37.3389
Min value 37.0434

CORRECTED LONGITUDE (DEGREES)
No of obs 778
Mean -23.0970
Standard dev 0.274840
Max value -23.5219
Min value -24.4650

NORTHWARD WIND COMPT (M S-1)
No of obs 778
Mean 5.36087
Standard dev 0.690231
Max value 6.65119
Min value 3.64623

EASTWARD WIND COMPT (M S-1)
No of obs 778
Mean 6.97660
Standard dev 0.943901
Max value 8.77902
Min value 4.85733

VERTICAL WIND COMPT (M S-1)
No of obs 778
Mean -0.129385
Standard dev 0.416251
Max value 0.489784
Min value -1.81758

WIND SPEED (MS-1)
No of obs 778
Mean 8.85466
Standard dev 0.610672
Max value 10.1213
Min value 7.37304

WIND DIRECTION (DEG)
Mean 232.461

TRUE AIR SPEED (M S-1)
No of obs 778
Mean 107.002
Standard dev 1.54991
Max value 110.486
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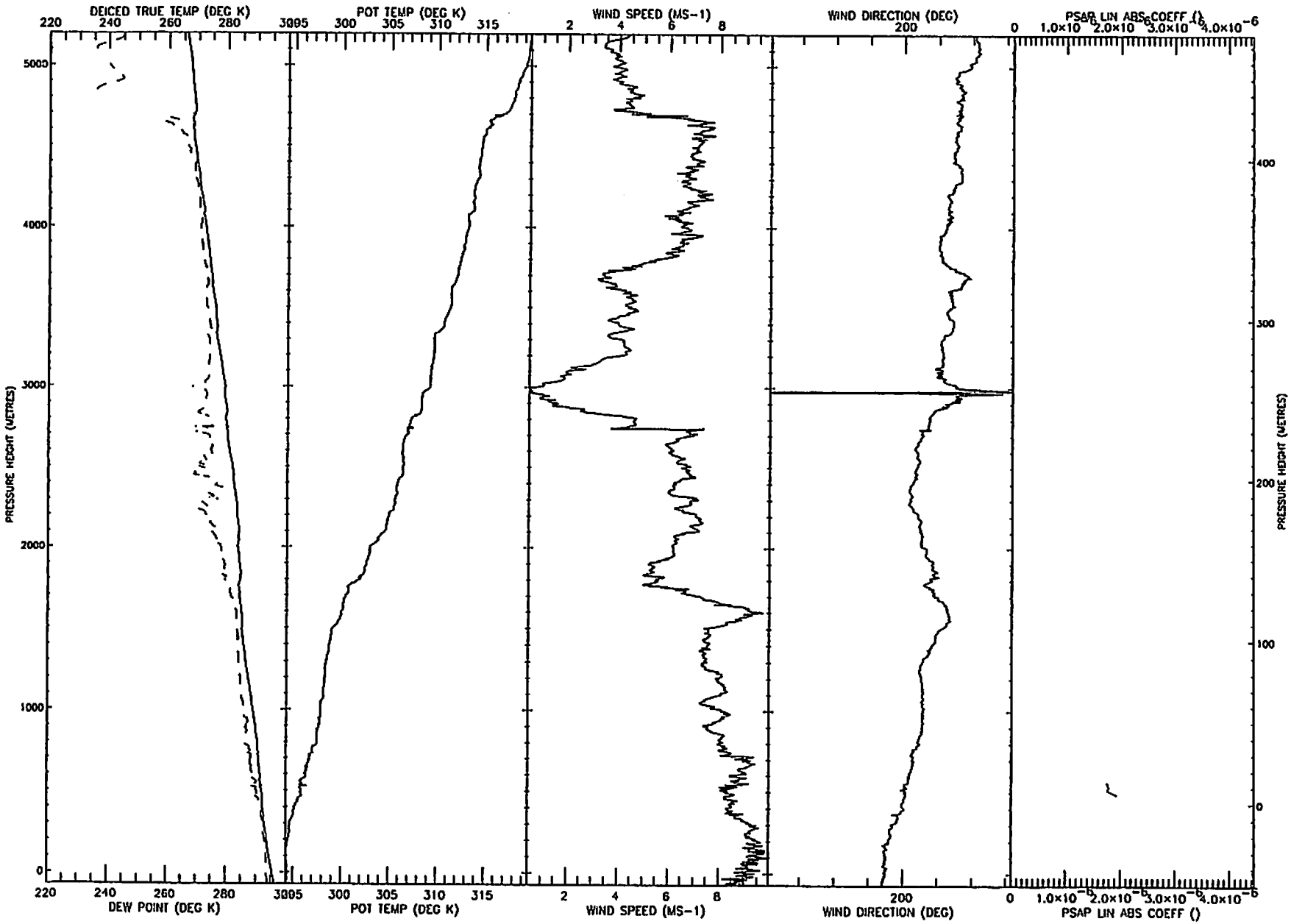
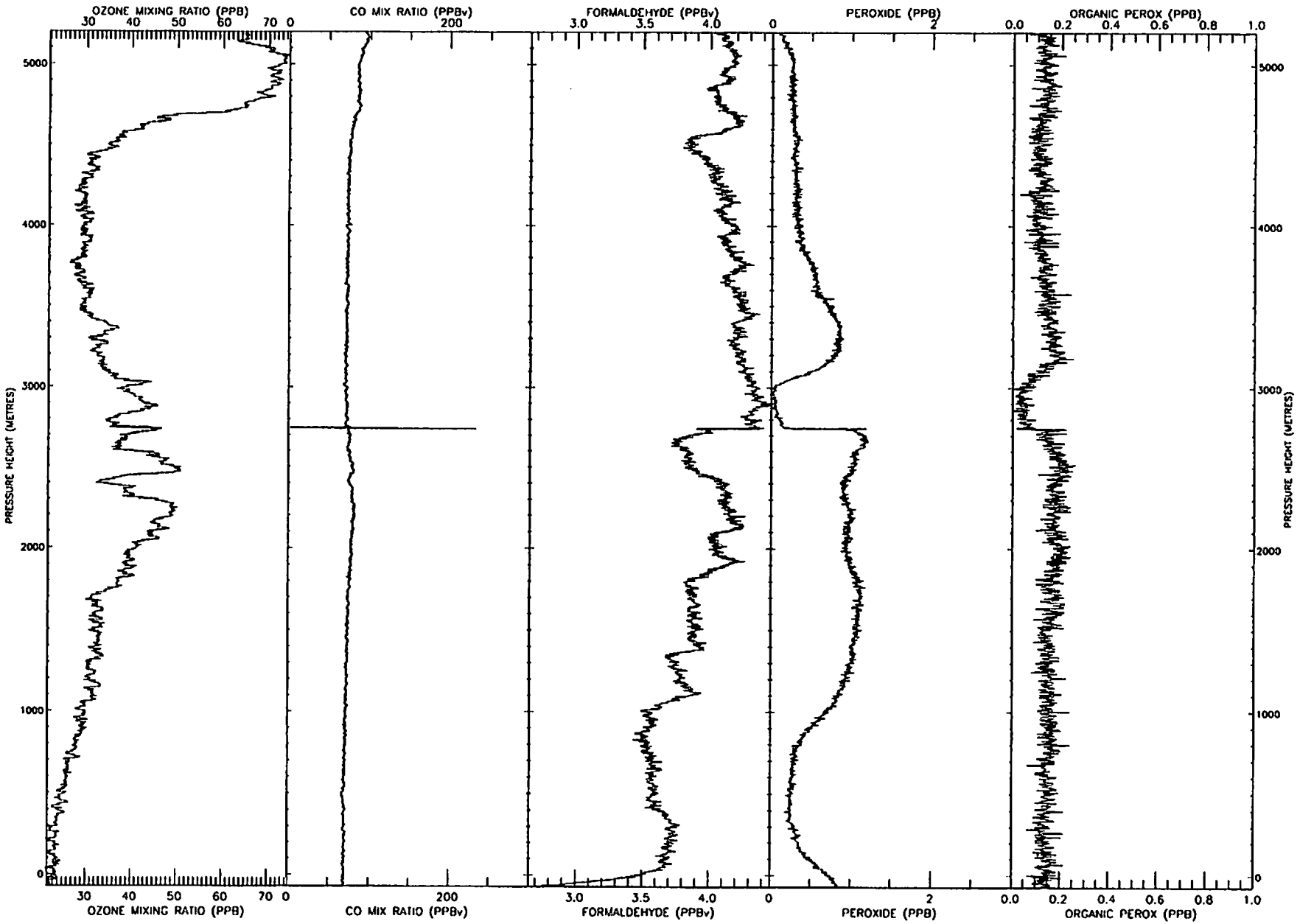
HEADING (DEG)
Mean 68.6195

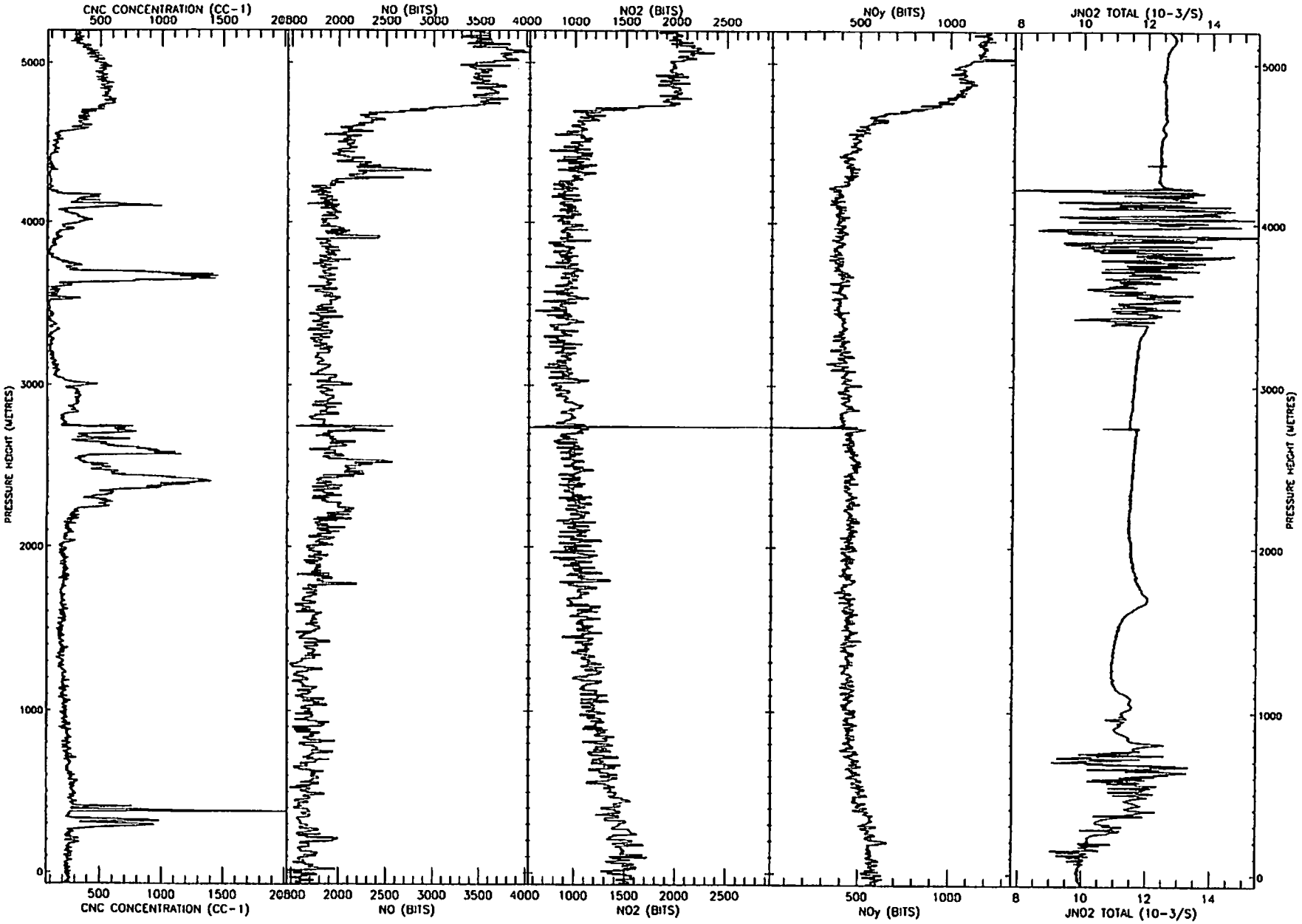
A579 20-SEP-97 P1 50'-FL170 From 113416-120941 *Plotted 7-May-1998 09:39*



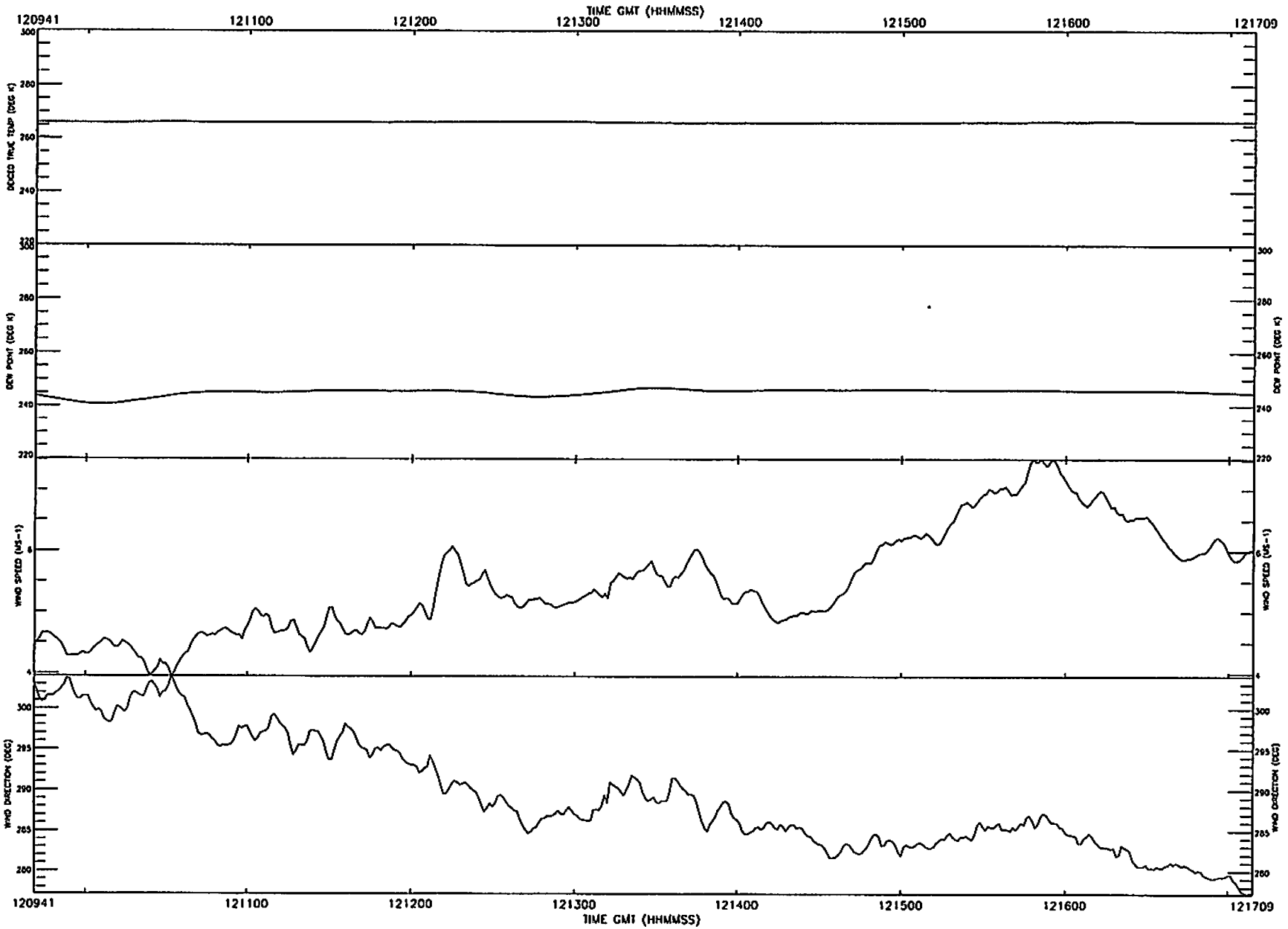
A579 20-SEP-97 P1 50'-FL170 From 113416-120941 *Plotted 7-May-1998 09:40*



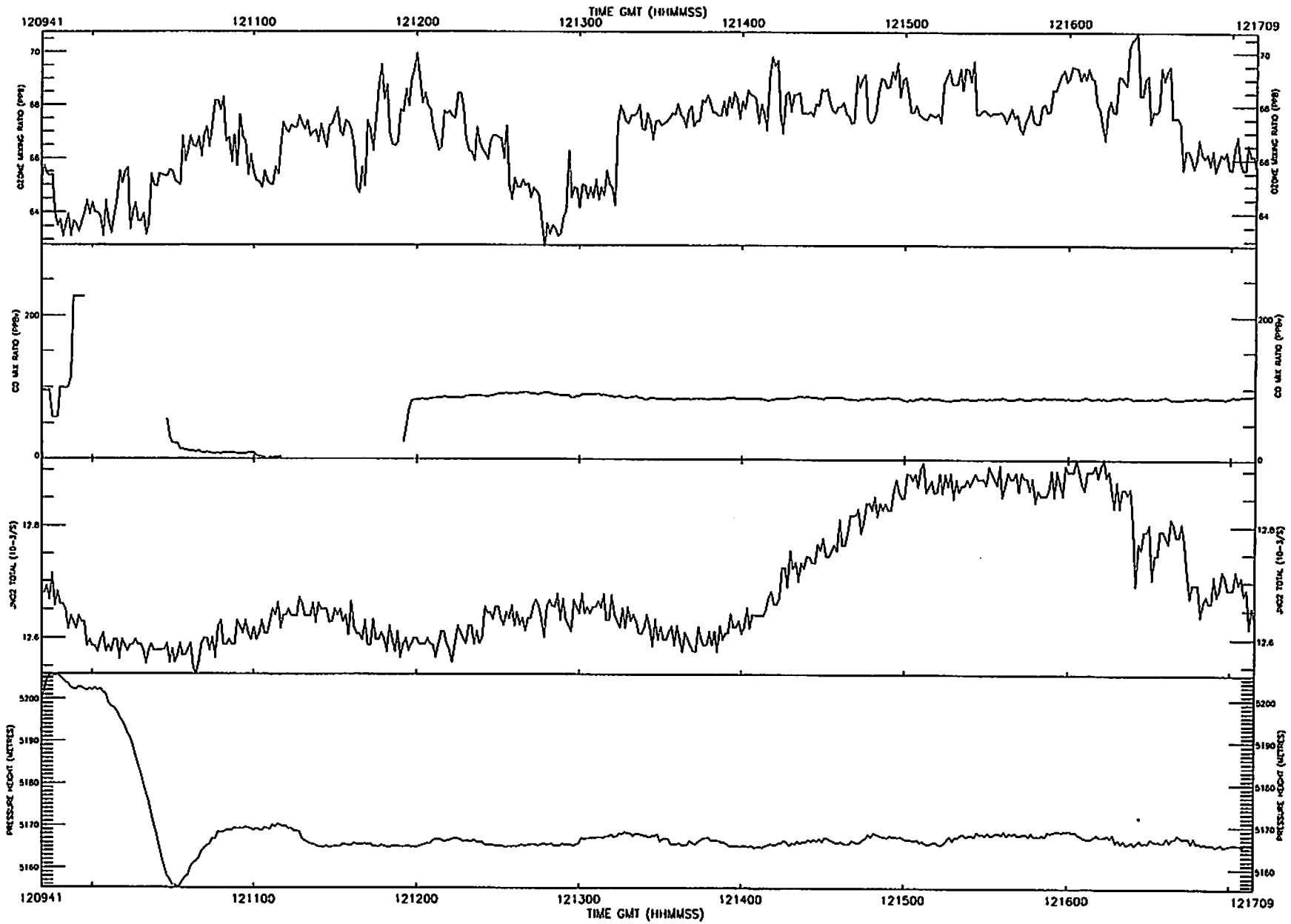
A579 20-SEP-97 P1 50'-FL170 From 113416-120941 *Plotted 7-May-1998 09:40*



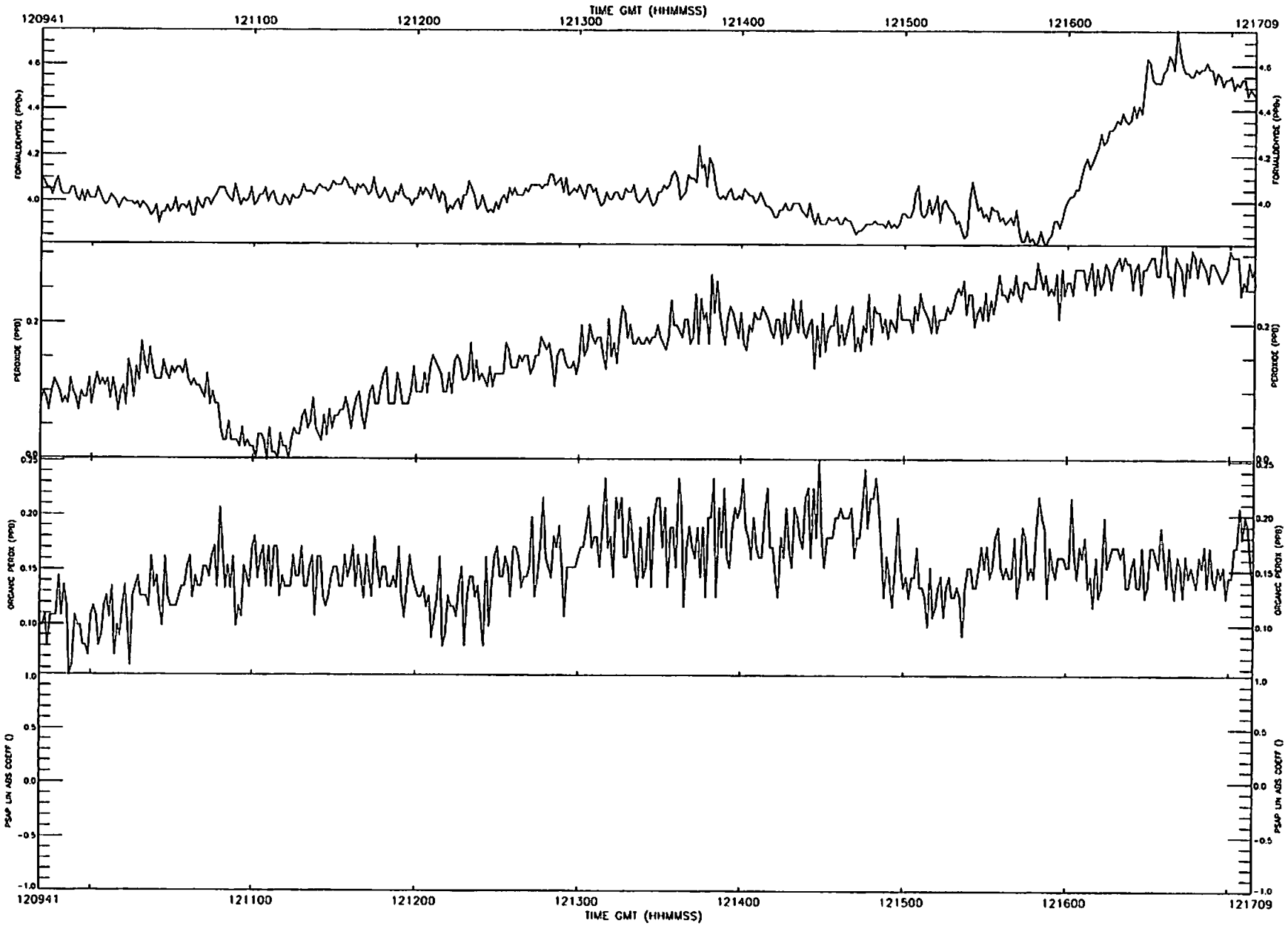
A579 20-SEP-97 R2 FL170 From 120941-121709 *Plotted 7-May-1998 09:43*



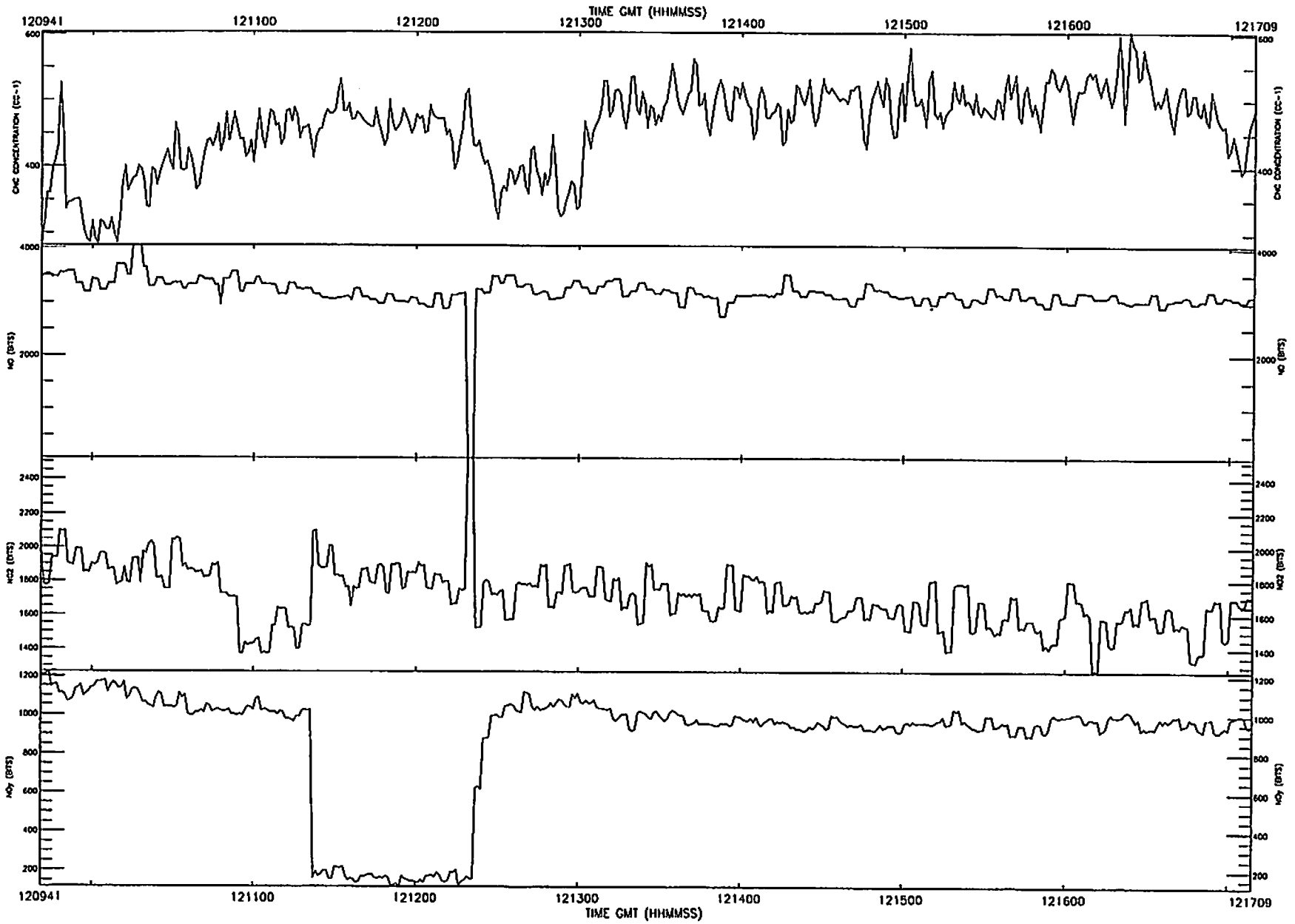
A579 20-SEP-97 R2 FL170 From 120941-121709 *Plotted 7-May-1998 09:43*



A579 20-SEP-97 R2 FL170 From 120941-121709 *Plotted 7-May-1998 09:43*



A579 20-SEP-97 R2 FL170 From 120941-121709 *Plotted 7-May-1998 09:43*



STATIC PRESSURE (MB)
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Standard dev 0.678290
Max value 529.076
Min value 525.498

DEICED TRUE TEMP (DEG K)
No of obs 449
Mean 266.198
Standard dev 0.152020
Max value 266.553
Min value 265.909

DEW POINT (DEG K)
No of obs 449
Mean 245.323
Standard dev 1.42470
Max value 247.072
Min value 240.637

OZONE MIXING RATIO (PPB)
No of obs 449
Mean 66.9371
Standard dev 1.65343
Max value 70.7645
Min value 62.8219

PSAP LIN ABS COEFF ()
No of obs 449
Mean 1.000000e-38
Standard dev 0.000000
Max value 1.000000e-38
Min value 1.000000e-38

JNO2 TOTAL (10-3/S)
No of obs 449
Mean 12.6943
Standard dev 0.110677
Max value 12.9199
Min value 12.5361

PRESSURE HEIGHT (METRES)
No of obs 449
Mean 5169.33
Standard dev 9.58385
Max value 5205.84
Min value 5155.30

CORRECTED LATITUDE (DEGREES)
No of obs 449
Mean 39.3284
Standard dev 0.139074
Max value 39.5686
Min value 39.0881

CORRECTED LONGITUDE (DEGREES)
No of obs 449
Mean -22.3457
Standard dev 4.090567e-02
Max value -22.2731
Min value -22.4155

NORTHWARD WIND COMPT (M S-1)
No of obs 449
Mean -1.73856
Standard dev 0.403111
Max value -0.750267
Min value -2.43789

EASTWARD WIND COMPT (M S-1)
No of obs 449
Mean 5.16296
Standard dev 0.985123
Max value 7.21850
Min value 3.27969

VERTICAL WIND COMPT (M S-1)
No of obs 449
Mean -0.475955
Standard dev 0.390042
Max value 8.026123e-02
Min value -1.29450

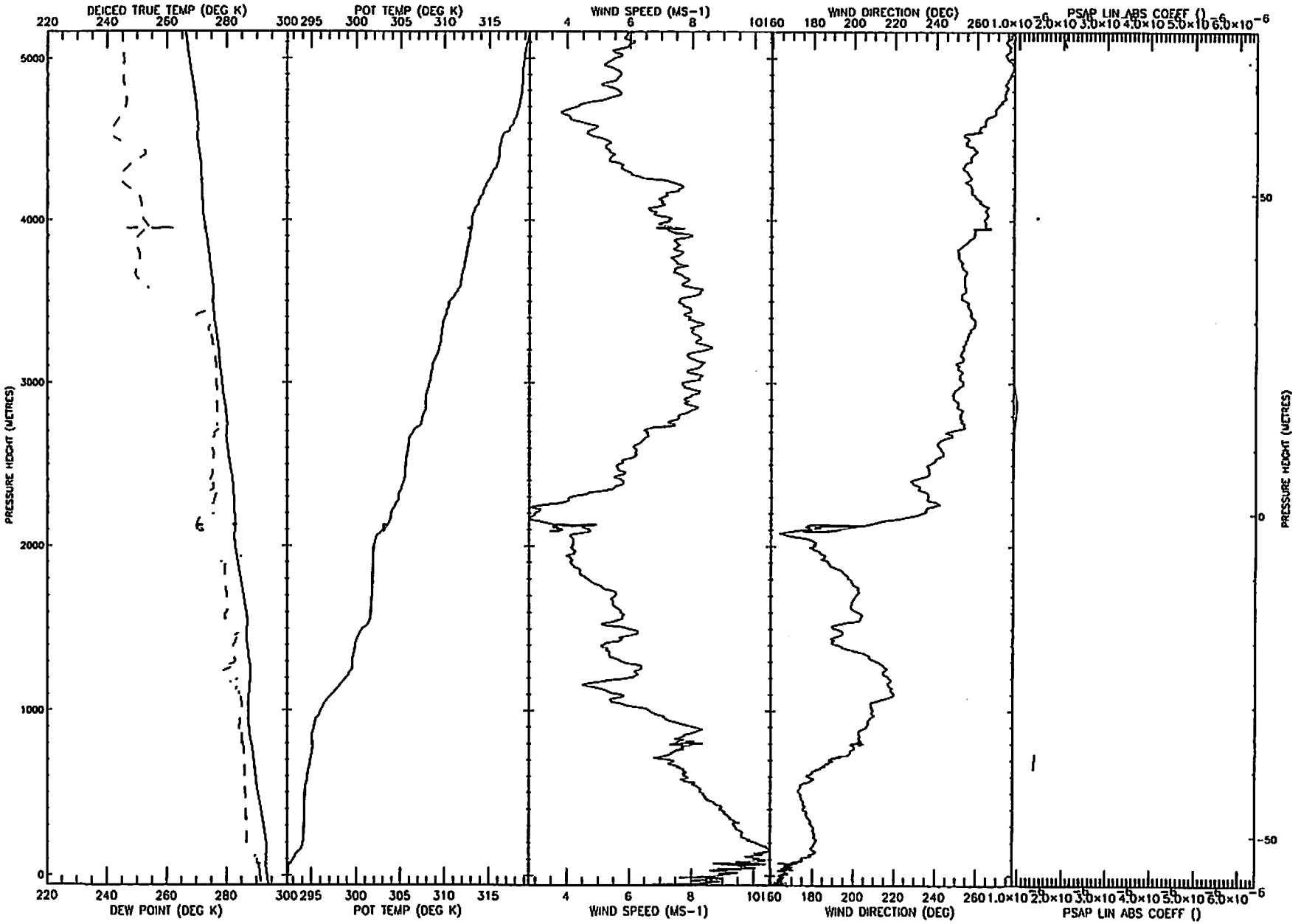
WIND SPEED (MS-1)
No of obs 449
Mean 5.48402
Standard dev 0.858136
Max value 7.51529
Min value 3.95507

WIND DIRECTION (DEG)
Mean 288.610

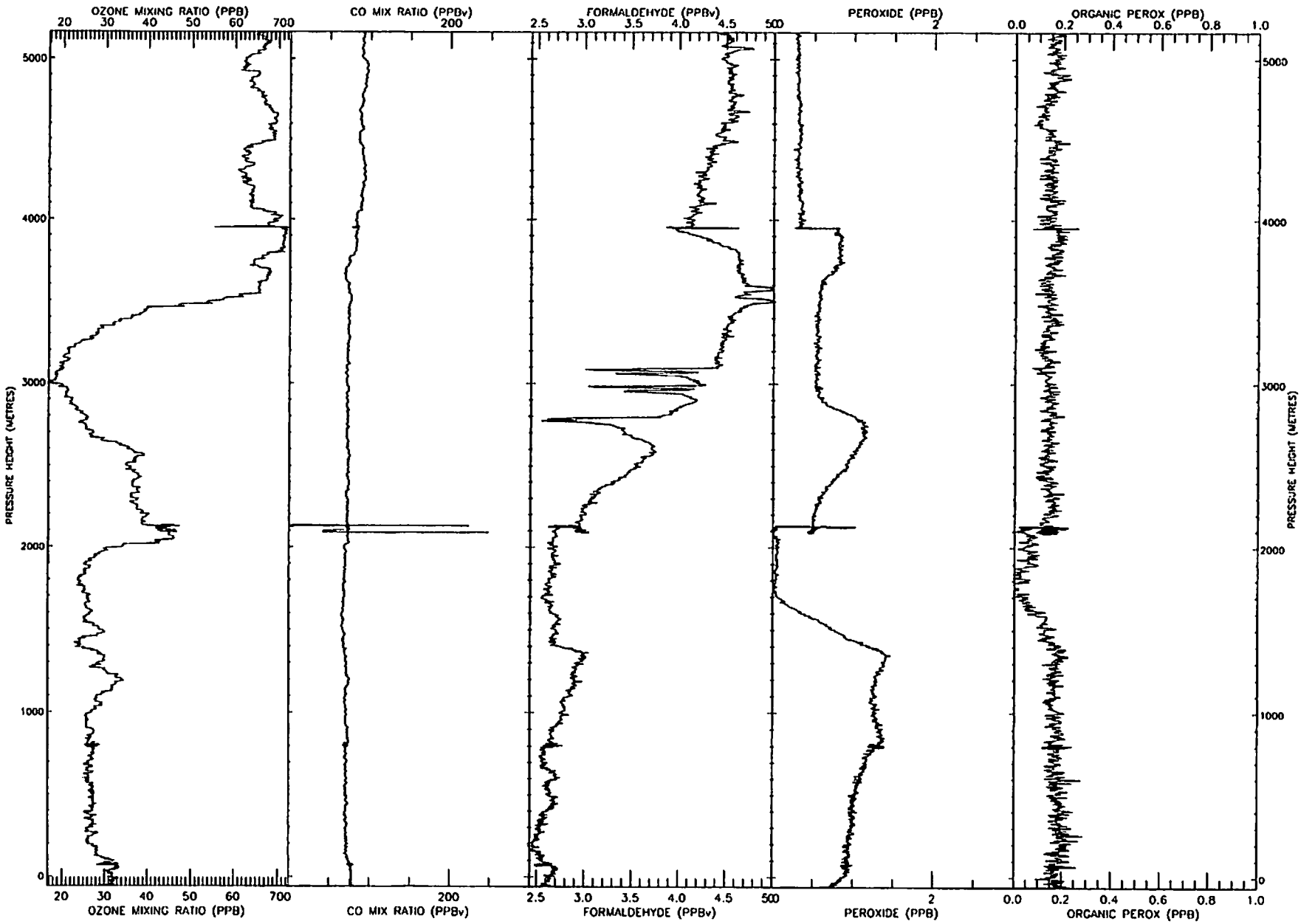
TRUE AIR SPEED (M S-1)
No of obs 449
Mean 124.847
Standard dev 1.01342
Max value 128.830
Min value 122.974

HEADING (DEG)
Mean 347.038

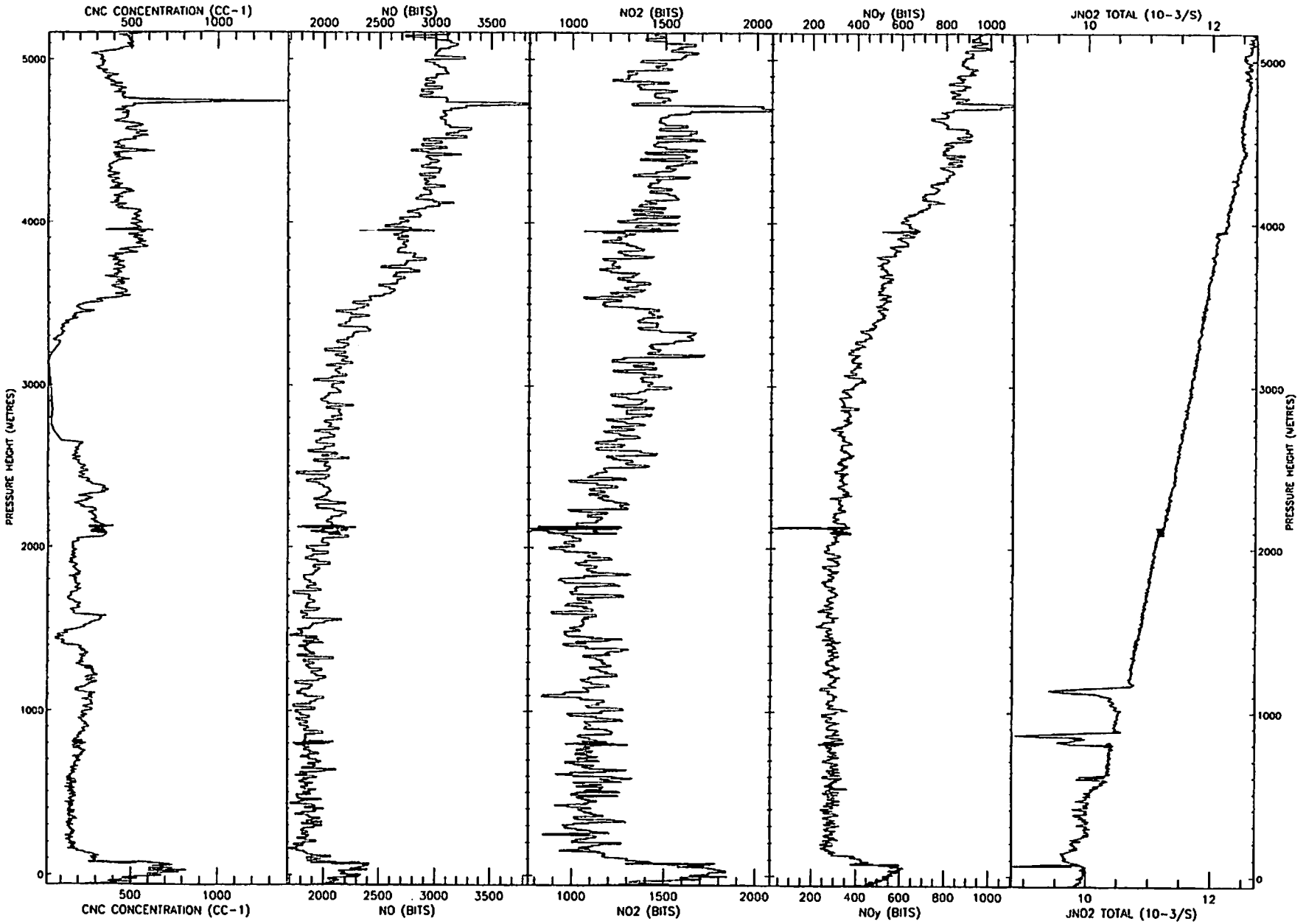
A579 20-SEP-97 P2 FL170-50' R/FL130/FL70/3000'/500' From 121709-124648 *Plotted* 7-May-1998



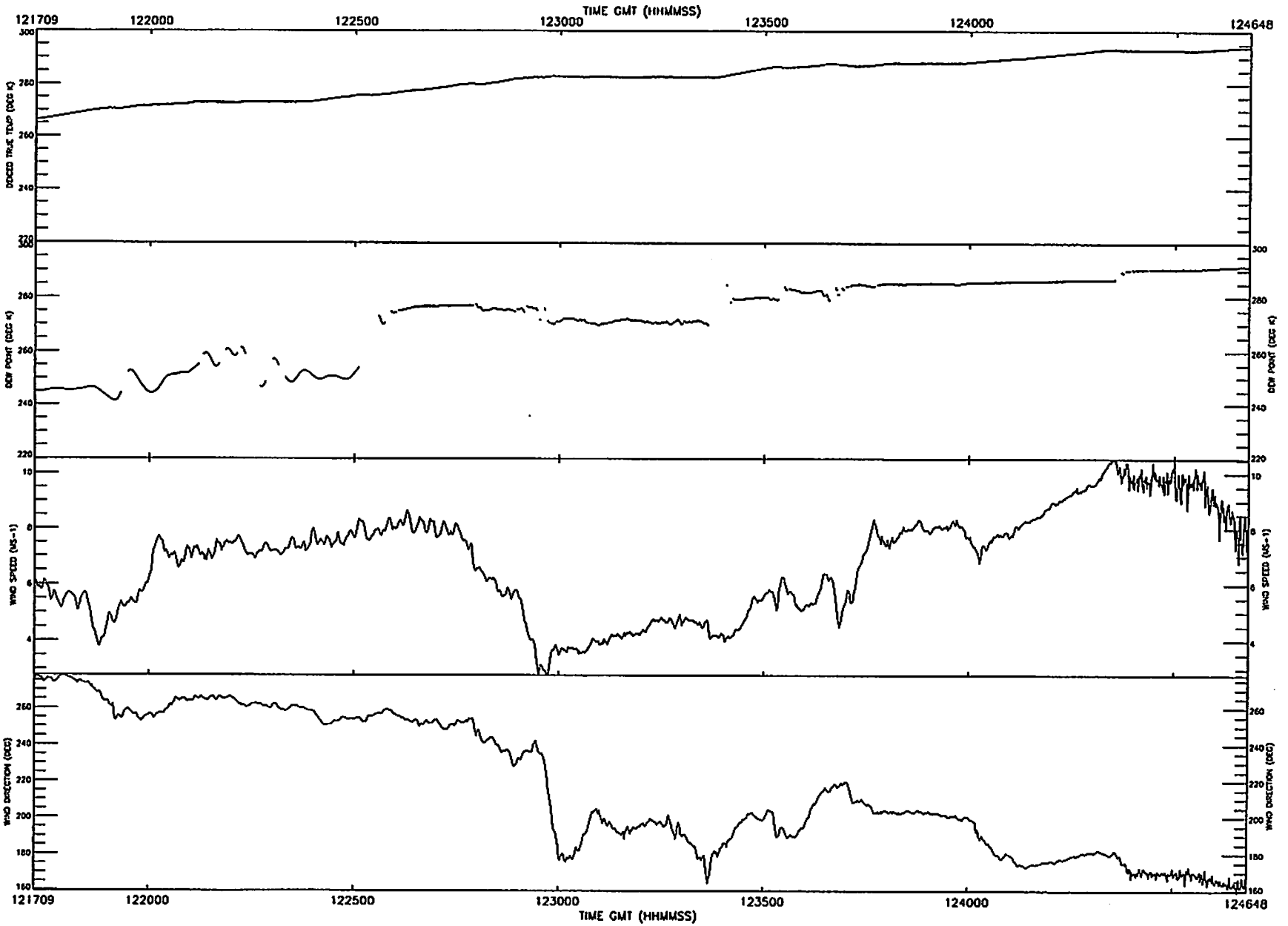
A579 20-SEP-97 P2 FL170-50' R/FL130/FL70/3000'/500' From 121709-124648 *Plotted* 7-May-1998



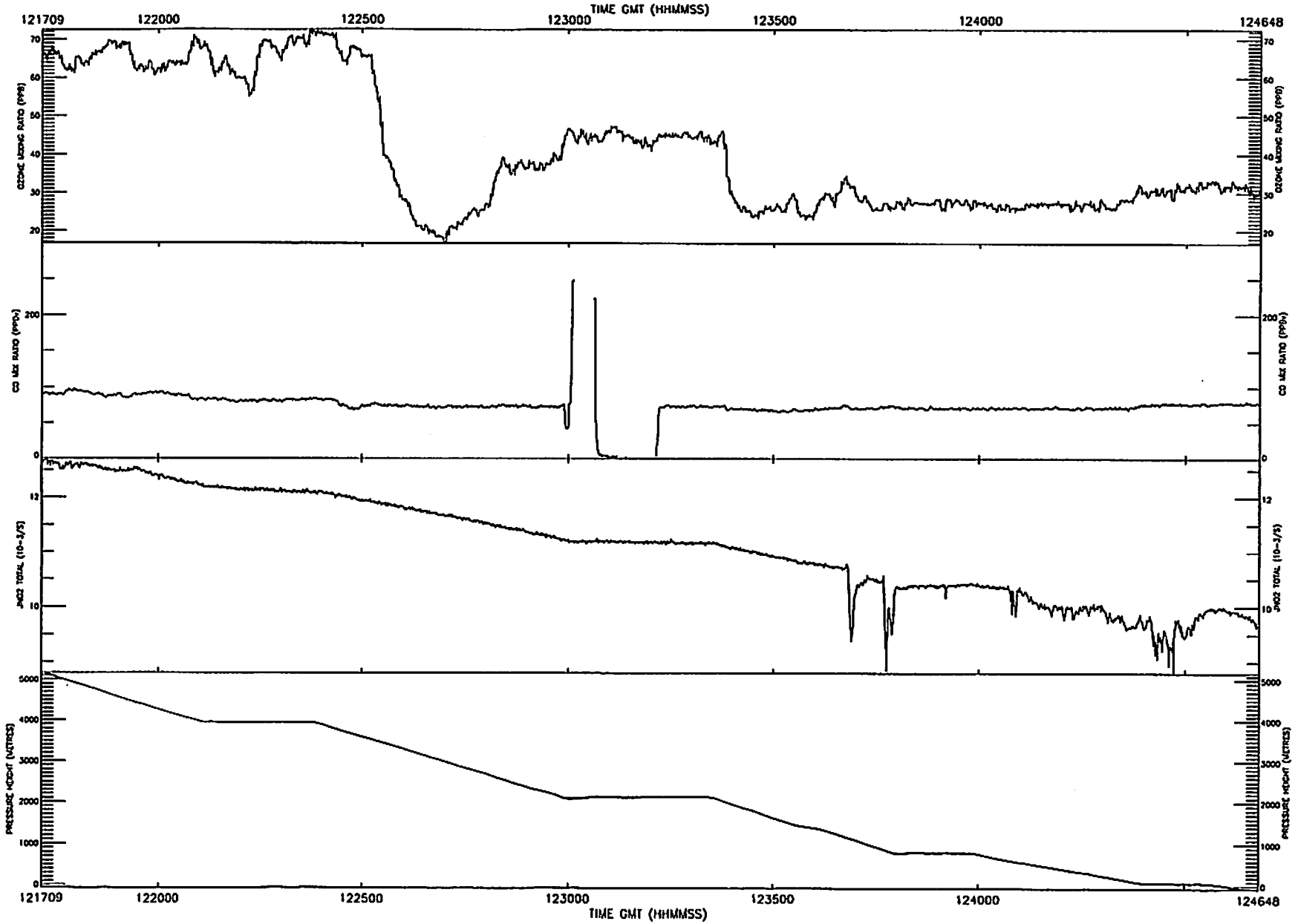
A579 20-SEP-97 P2 FL170-50' R/FL130/FL70/3000'/500' From 121709-124648 *Plotted* 7-May-1998



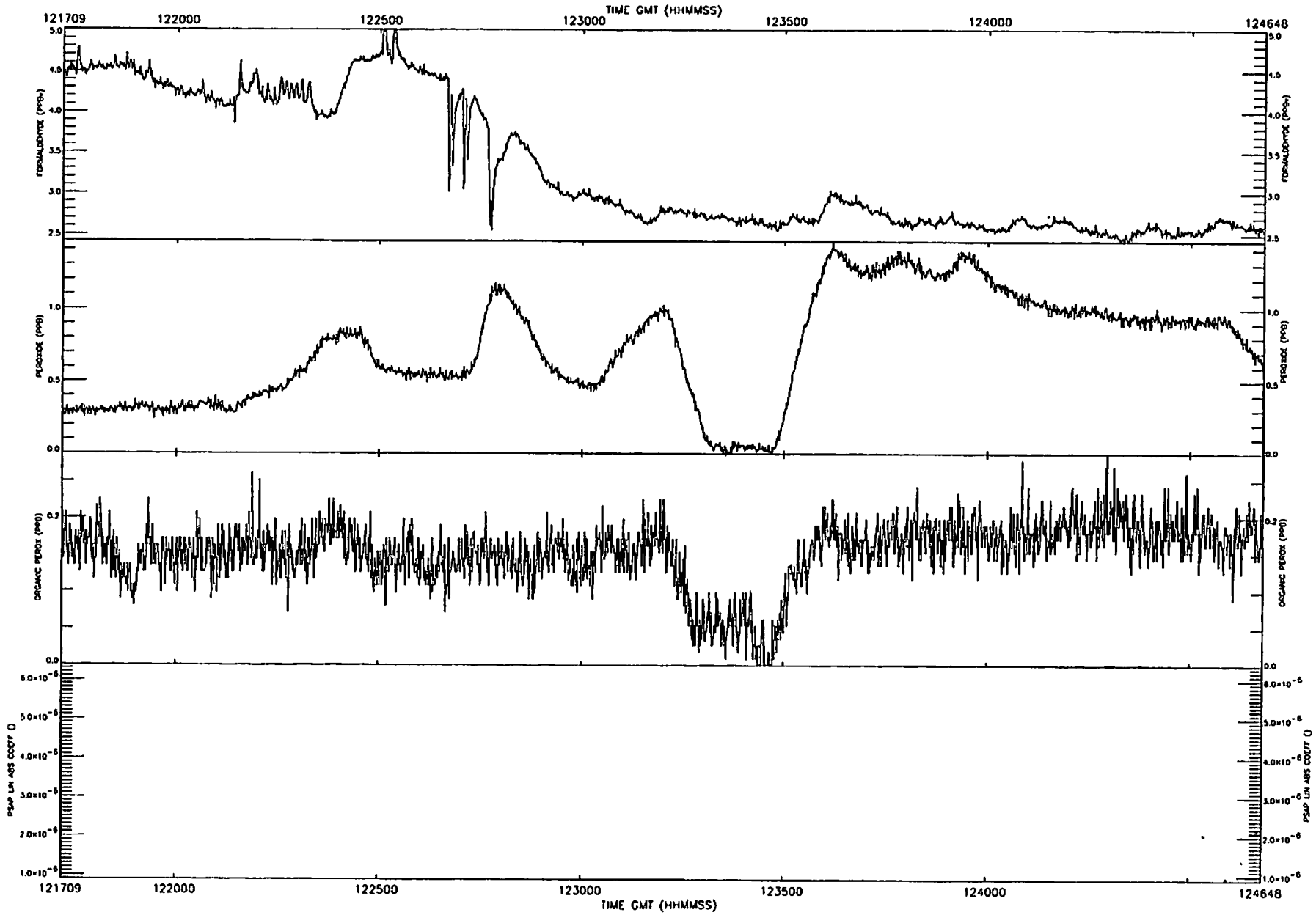
A579 20-SEP-97 P2 FL170-50' R/FL130/FL70/3000'/500' From 121709-124648 *Plotted* 7-May-1998



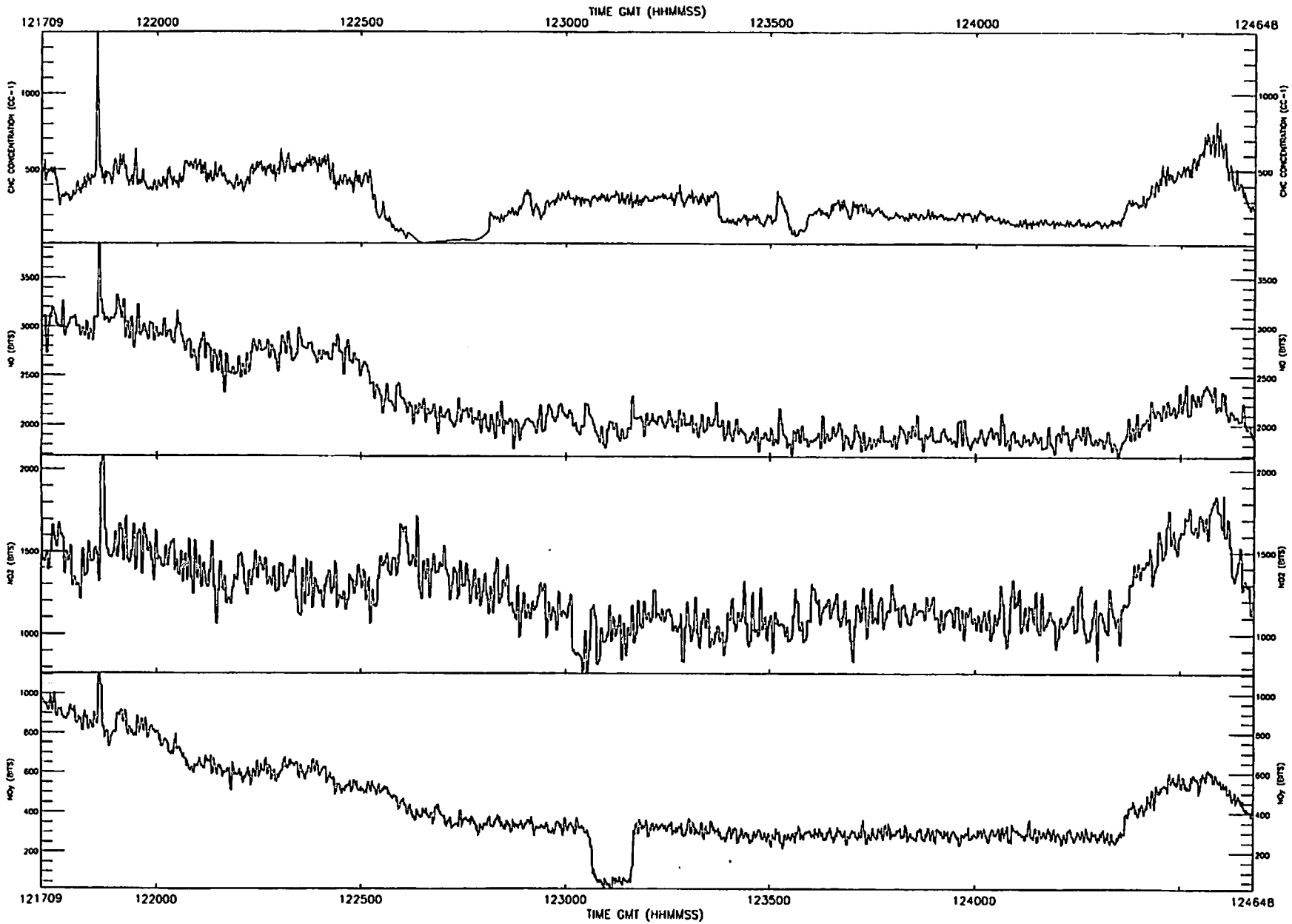
A579 20-SEP-97 P2 FL170-50' R/FL130/FL70/3000'/500' From 121709-124648 *Plotted* 7-May-1998



A579 20-SEP-97 P2 FL170-50' R/FL130/FL70/3000'/500' From 121709-124648 *Plotted* 7-May-1998



A579 20-SEP-97 P2 FL170-50' R/FL130/FL70/3000'/500' From 121709-124648 *Plotted 7-May-1998*



A579 20-SEP-97 P2 FL170-50' R/FL130/FL70/3000'/500' From 121709-124648 *Plotted 7-May-1998*

STATIC PRESSURE (MB)
No of obs 1780
Mean 788.494
Standard dev 147.804
Max value 1020.44
Min value 528.346

DEICED TRUE TEMP (DEG K)
No of obs 1780
Mean 282.271
Standard dev 7.79385
Max value 294.035
Min value 266.283

DEW POINT (DEG K)
No of obs 1780
Mean 272.489
Standard dev 15.0614
Max value 291.655
Min value 241.344

OZONE MIXING RATIO (PPB)
No of obs 1780
Mean 41.0413
Standard dev 16.6543
Max value 72.5142
Min value 16.6566

PSAP LIN ABS COEFF ()
No of obs 1780
Mean 3.765755e-08
Standard dev 4.202510e-07
Max value 6.385480e-06
Min value 1.000000e-38

JNO2 TOTAL (10-3/S)
No of obs 1780
Mean 11.1289
Standard dev 0.927801
Max value 12.7113
Min value 8.80133

PRESSURE HEIGHT (METRES)
No of obs 1780
Mean 2183.30
Standard dev 1536.45
Max value 5165.60
Min value -59.6528

CORRECTED LATITUDE (DEGREES)
No of obs 1780
Mean 40.4540
Standard dev 0.495183
Max value 41.2934
Min value 39.5686

CORRECTED LONGITUDE (DEGREES)
No of obs 1780
Mean -22.6736
Standard dev 0.150441
Max value -22.4155
Min value -22.9411

NORTHWARD WIND COMPT (M S-1)
No of obs 1780
Mean 4.43962
Standard dev 3.12891
Max value 10.5274
Min value -0.818657

EASTWARD WIND COMPT (M S-1)
No of obs 1780
Mean 3.14183
Standard dev 3.24509
Max value 8.29629
Min value -2.68295

VERTICAL WIND COMPT (M S-1)
No of obs 1780
Mean 0.361870
Standard dev 0.429574
Max value 1.35368
Min value -0.593346

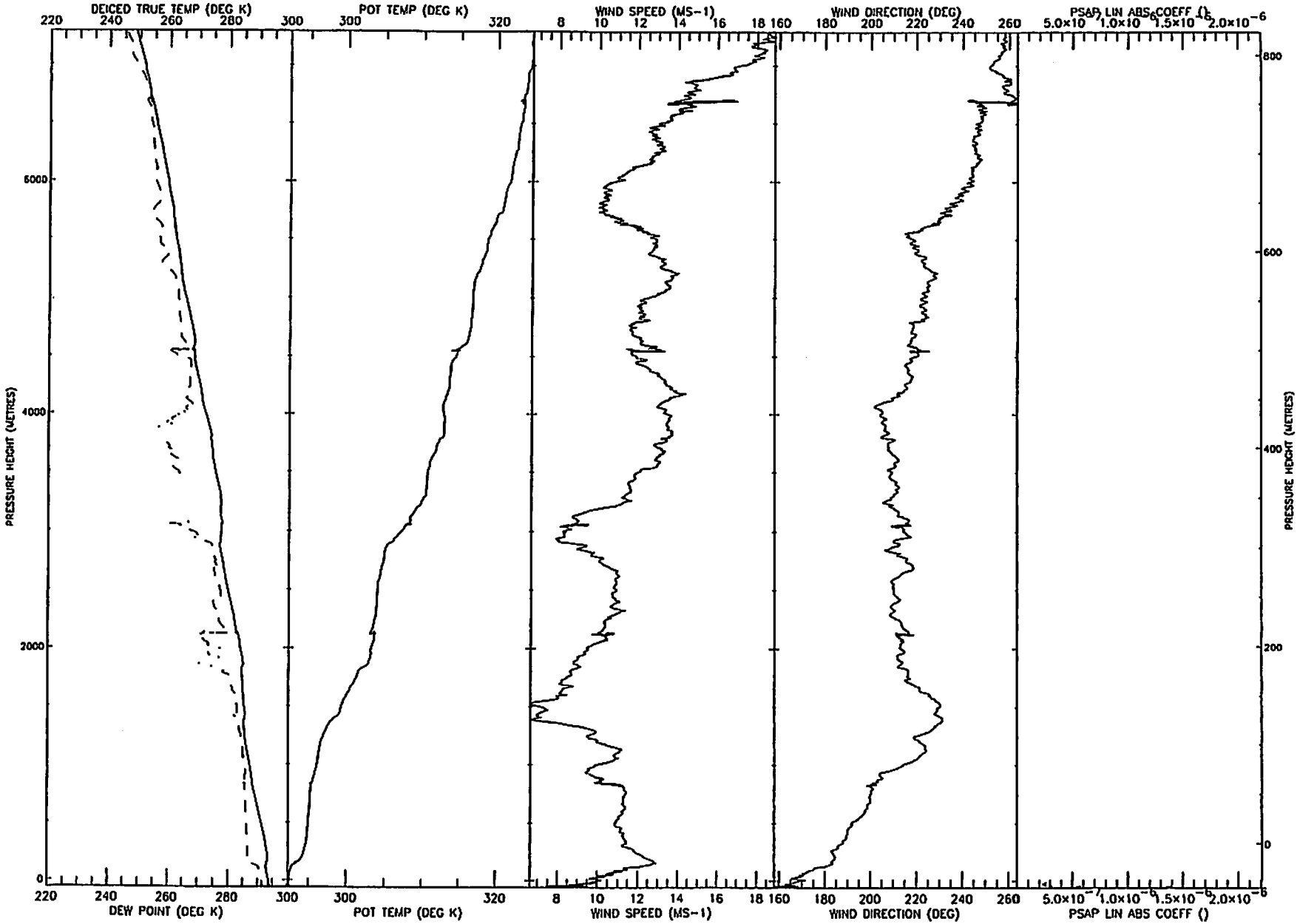
WIND SPEED (MS-1)
No of obs 1780
Mean 6.82249
Standard dev 1.82921
Max value 10.5281
Min value 2.78699

WIND DIRECTION (DEG)
Mean 215.286

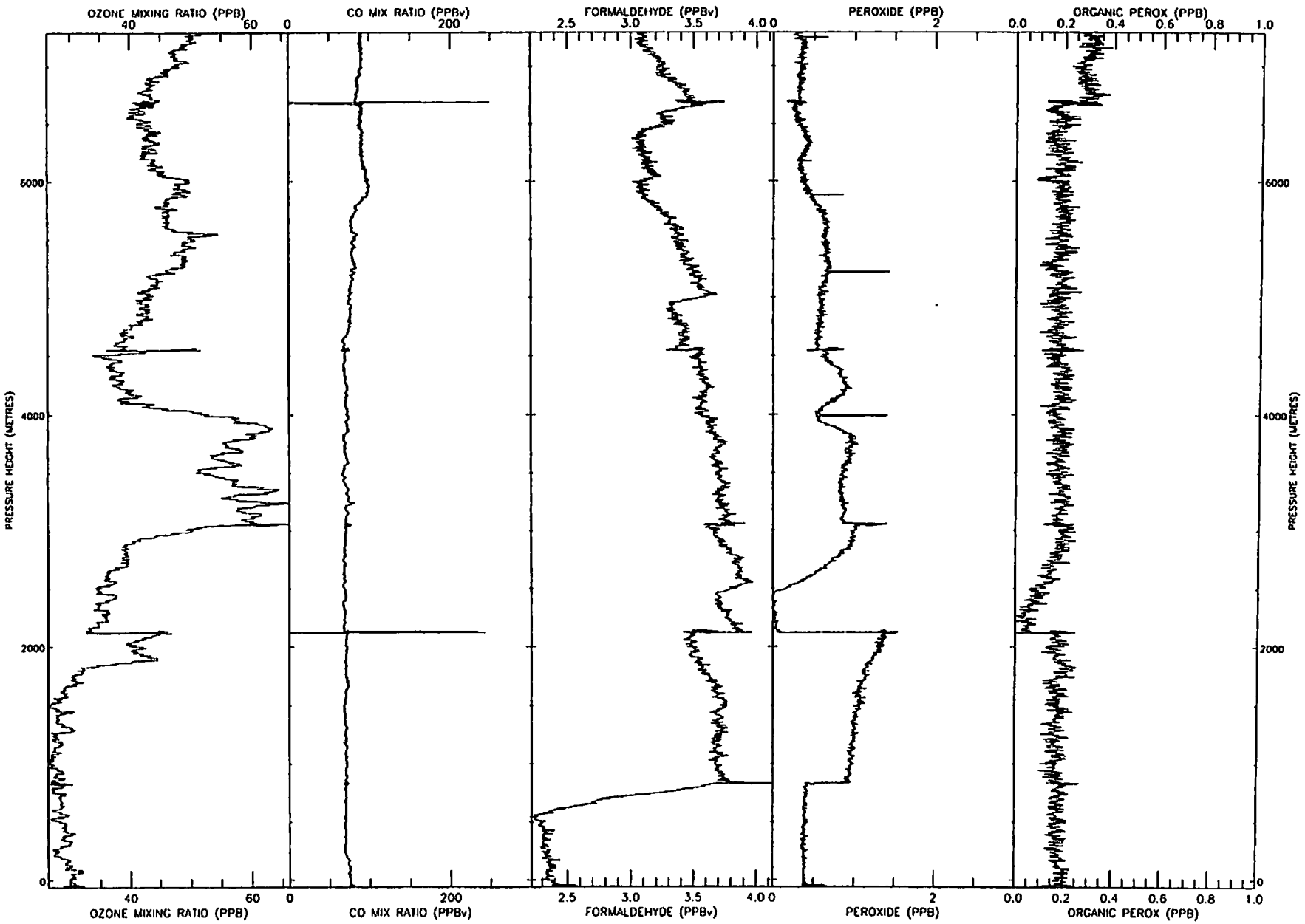
TRUE AIR SPEED (M S-1)
No of obs 1780
Mean 106.726
Standard dev 8.60140
Max value 125.183
Min value 91.5194

HEADING (DEG)
Mean 346.900

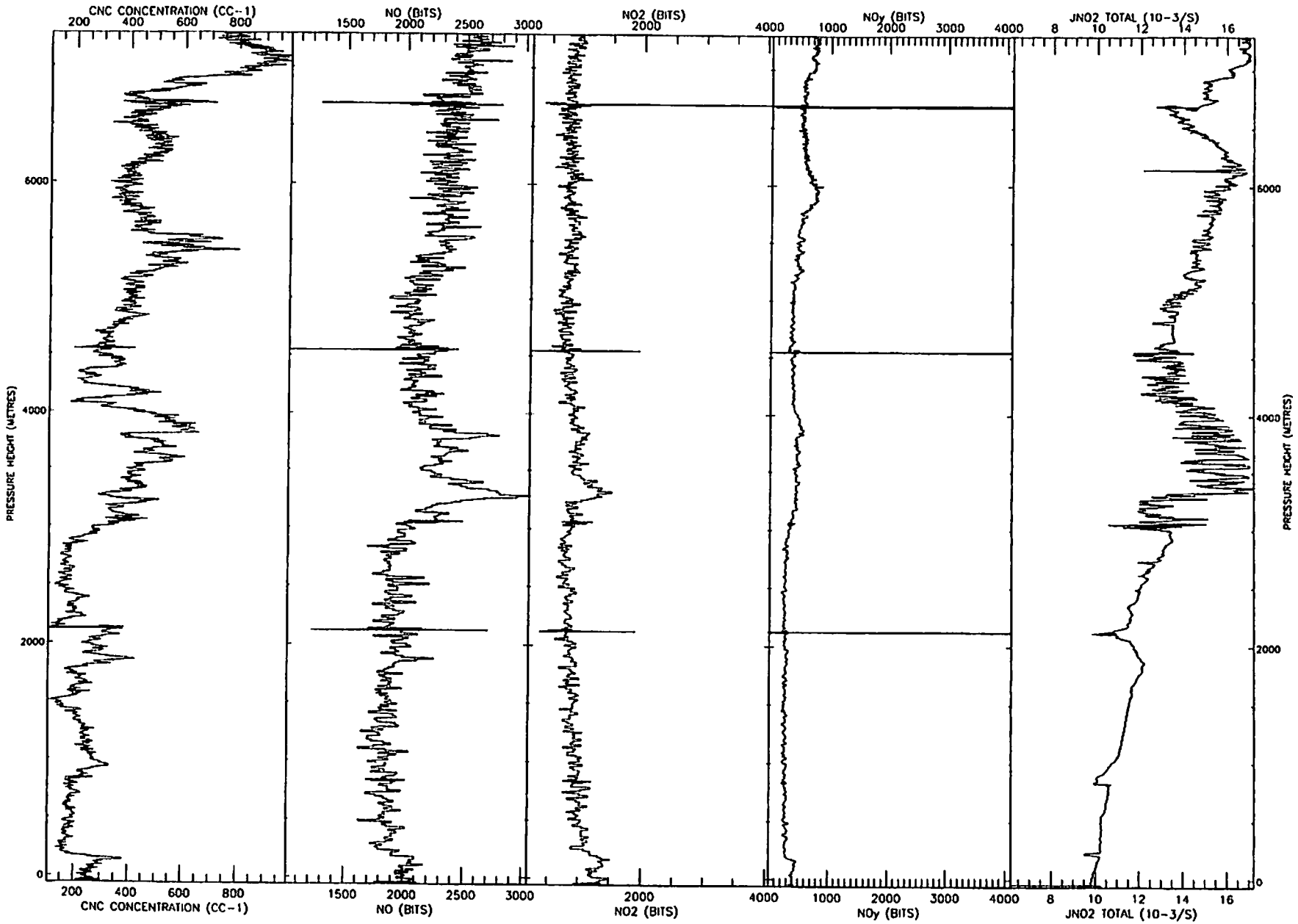
A579 20-SEP-97 P3 50'-FL240 R/100'/3000'/FL70/FL100/FL150/FL240 From 124648-133550 *Plotted*



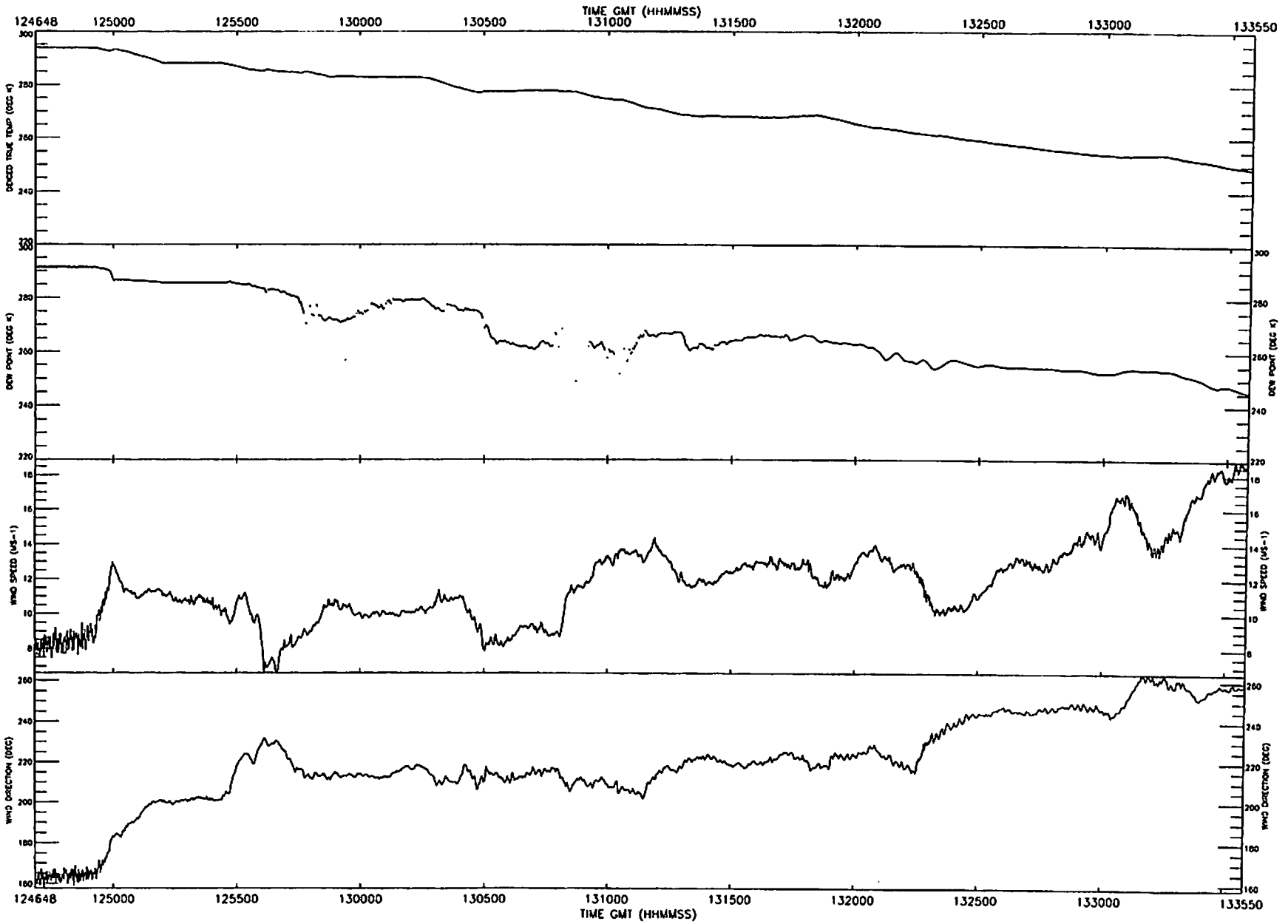
A579 20-SEP-97 P3 50'-FL240 R/100'/3000'/FL70/FL100/FL150/FL240 From 124648-133550 *Plotted*



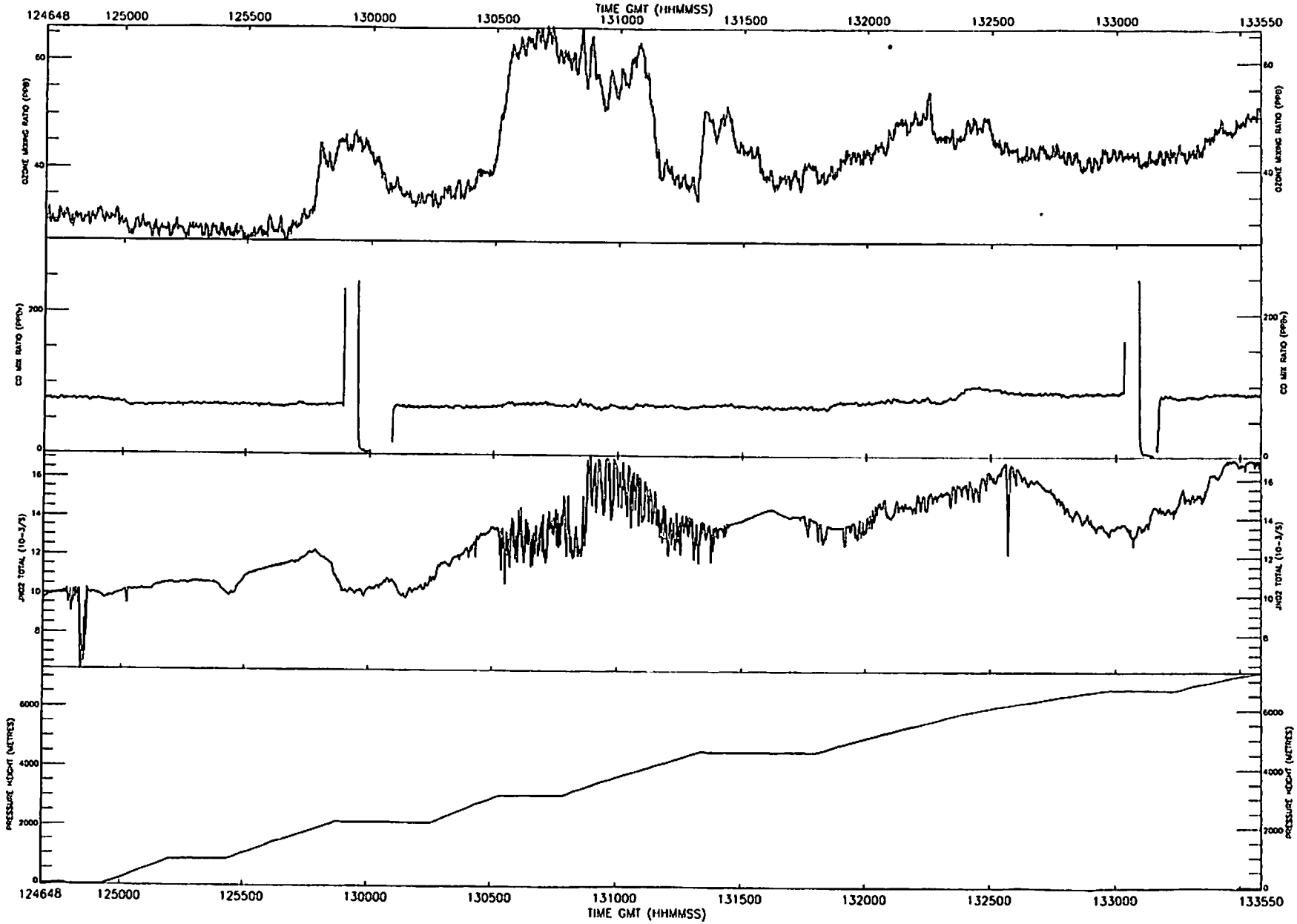
A579 20-SEP-97 P3 50'-FL240 R/100'/3000'/FL70/FL100/FL150/FL240 From 124648-133550 *Plotted*



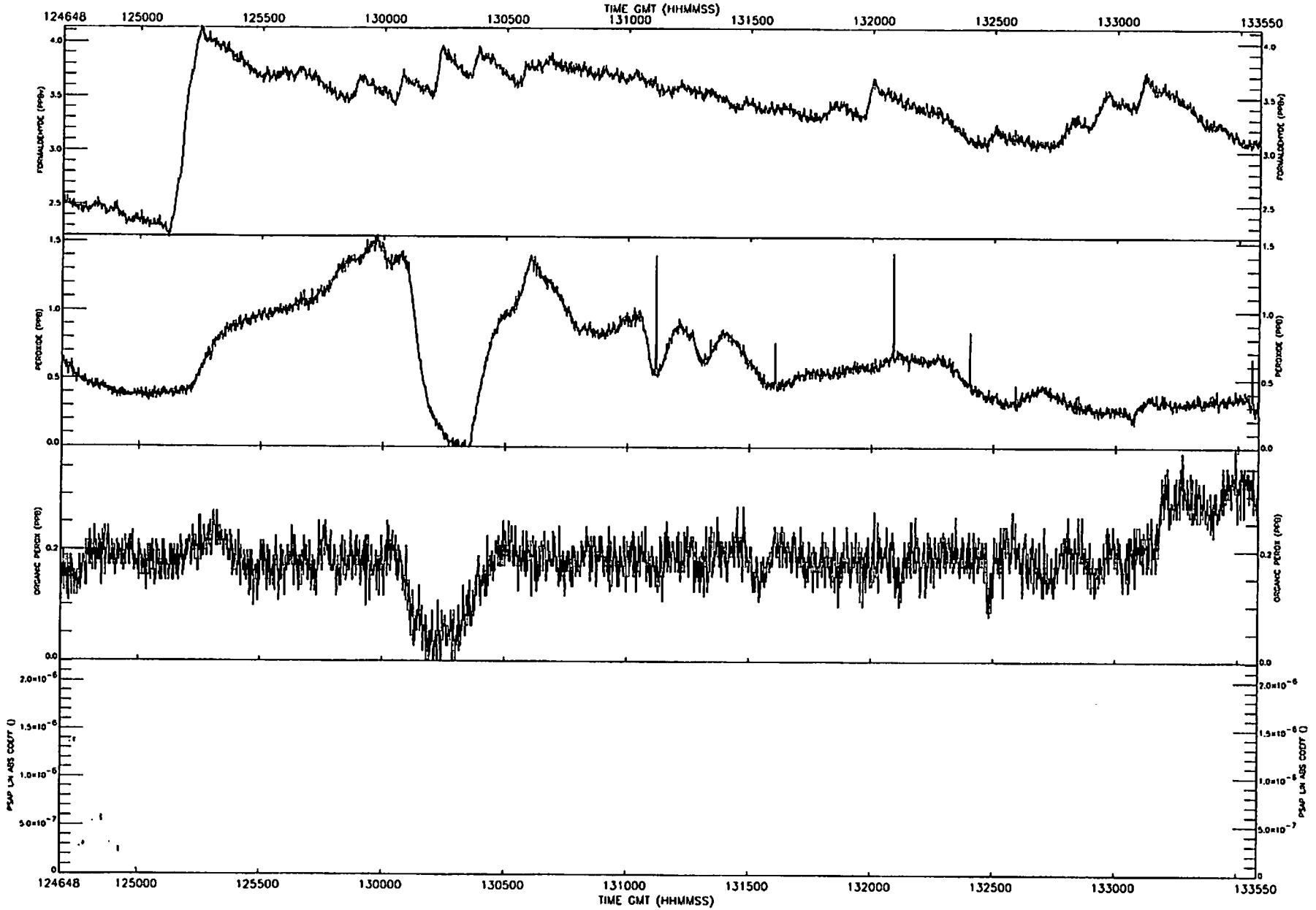
A579 20-SEP-97 P3 50'-FL240 R/100'/3000'/FL70/FL100/FL150/FL240 From 124648-133550 *Plotted*



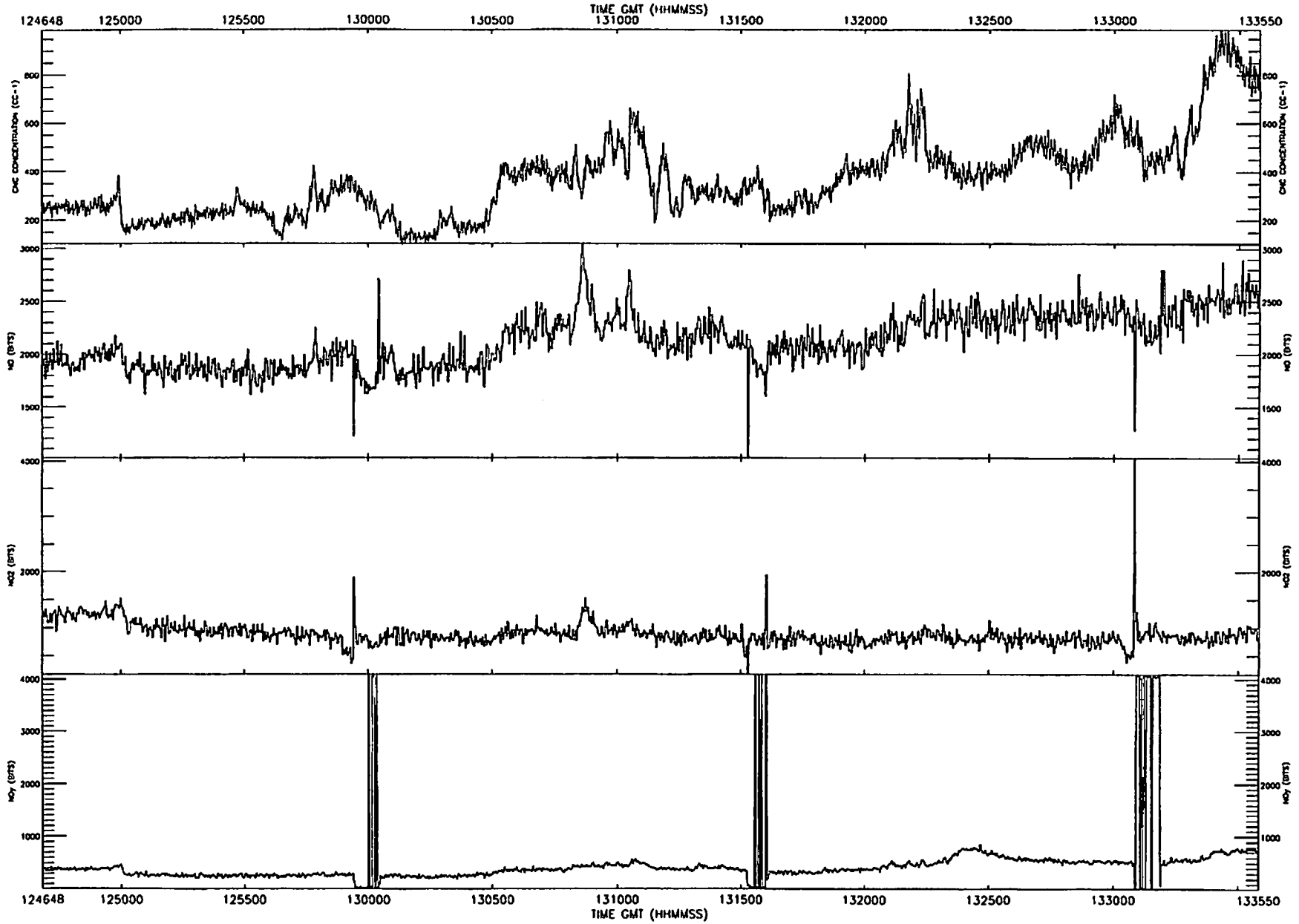
A579 20-SEP-97 P3 50'--FL240 R/100'/3000'/FL70/FL100/FL150/FL240 From 124648-133550 *Plotted*



A579 20-SEP-97 P3 50'-FL240 R/100'/3000'/FL70/FL100/FL150/FL240 From 124648-133550 *Plotted*



A579 20-SEP-97 P3 50'-FL240 R/100'/3000'/FL70/FL100/FL150/FL240 From 124648-133550 *Plotted*



A579 20-SEP-97 P3 50'-FL240 R/100'/3000'/FL70/FL100/FL150/FL240 From 124648-133550 *Plotted*

STATIC PRESSURE (MB)
No of obs 2943
Mean 658.008
Standard dev 188.694
Max value 1020.44
Min value 394.001

DEICED TRUE TEMP (DEG K)
No of obs 2943
Mean 272.429
Standard dev 13.1909
Max value 294.035
Min value 248.785

DEW POINT (DEG K)
No of obs 2943
Mean 267.470
Standard dev 12.8297
Max value 291.590
Min value 245.529

OZONE MIXING RATIO (PPB)
No of obs 2943
Mean 41.7009
Standard dev 9.53626
Max value 66.1196
Min value 26.2781

PSAP LIN ABS COEFF ()
No of obs 2943
Mean 5.474324e-09
Standard dev 8.467210e-08
Max value 2.209204e-06
Min value -1.046657e-09

JNO2 TOTAL (10-3/S)
No of obs 2943
Mean 13.0710
Standard dev 2.12915
Max value 17.2207
Min value 6.14791

PRESSURE HEIGHT (METRES)
No of obs 2943
Mean 3752.47
Standard dev 2216.53
Max value 7291.96
Min value -59.6528

CORRECTED LATITUDE (DEGREES)
No of obs 2943
Mean 42.6732
Standard dev 0.790040
Max value 43.8549
Min value 41.2934

CORRECTED LONGITUDE (DEGREES)
No of obs 2943
Mean -22.8153
Standard dev 0.417949
Max value -21.9841
Min value -23.3168

NORTHWARD WIND COMPT (M S-1)
No of obs 2943
Mean 7.92622
Standard dev 2.40812
Max value 12.9006
Min value 1.56428

EASTWARD WIND COMPT (M S-1)
No of obs 2943
Mean 7.44814
Standard dev 4.48341
Max value 18.4964
Min value -2.85857

VERTICAL WIND COMPT (M S-1)
No of obs 2943
Mean -0.619025
Standard dev 0.524157
Max value 1.19539
Min value -1.62964

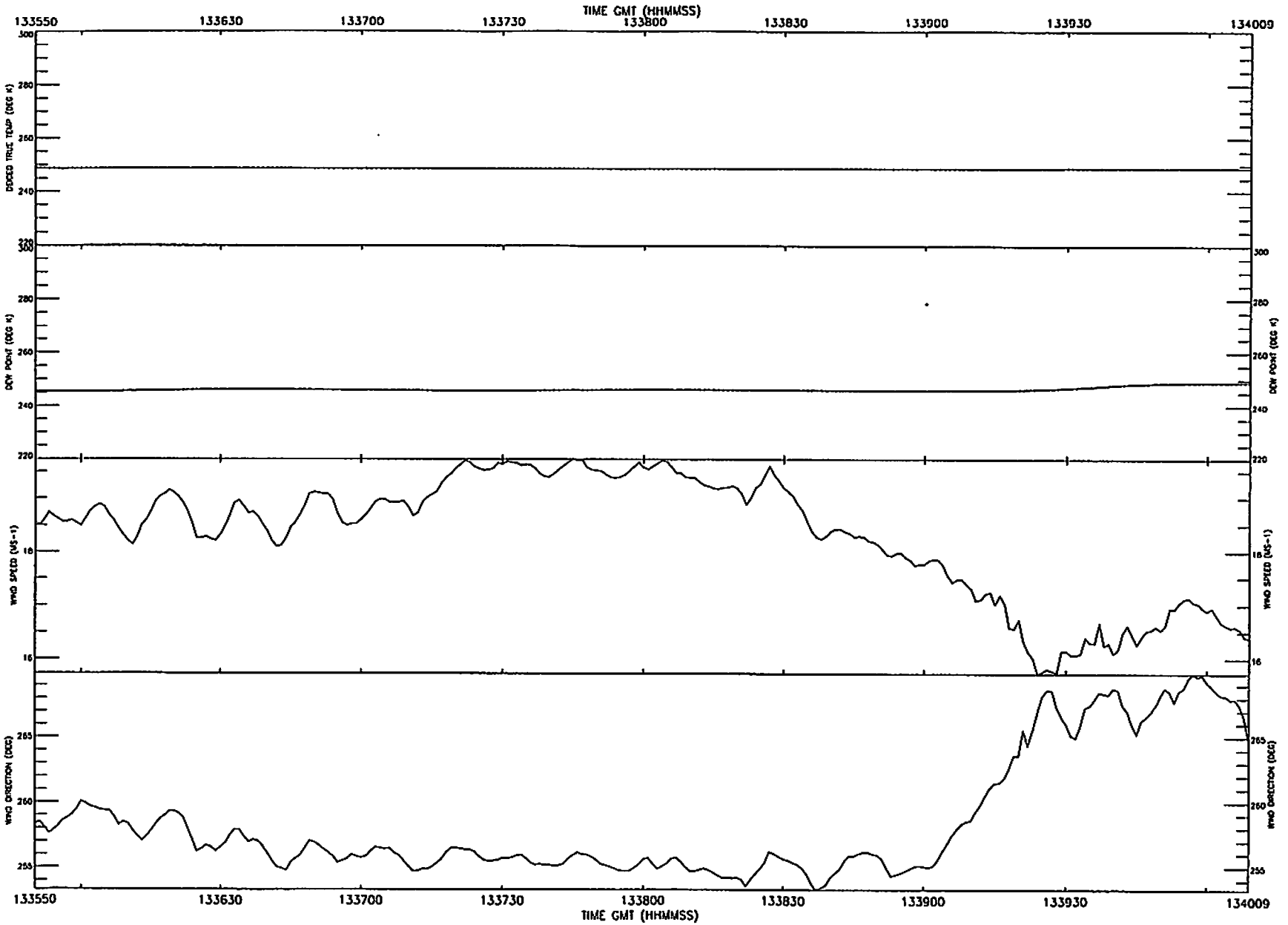
WIND SPEED (MS-1)
No of obs 2943
Mean 11.7659
Standard dev 2.39917
Max value 18.8962
Min value 6.63241

WIND DIRECTION (DEG)
Mean 223.219

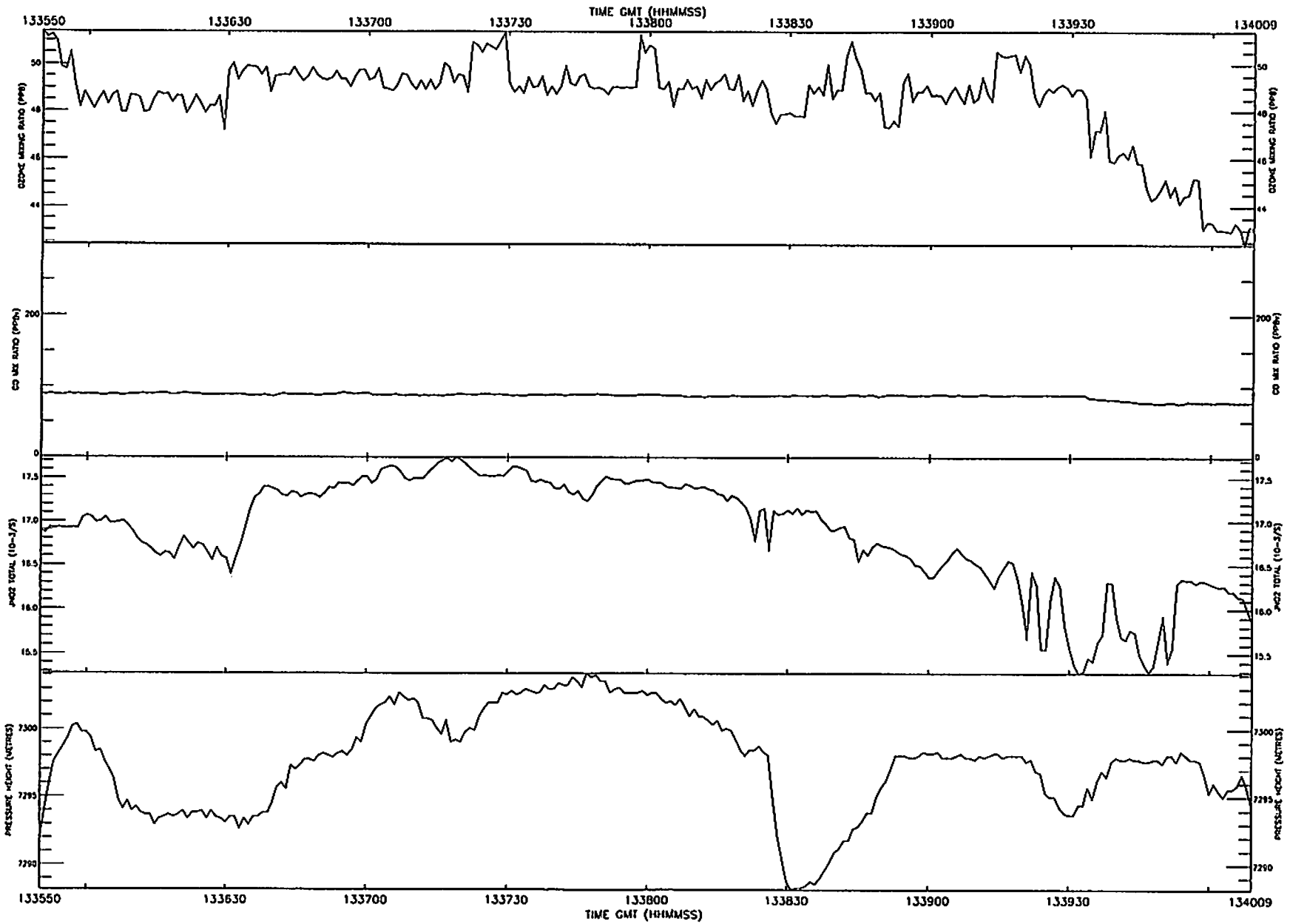
TRUE AIR SPEED (M S-1)
No of obs 2943
Mean 114.672
Standard dev 13.3662
Max value 145.096
Min value 92.8864

HEADING (DEG)
Mean 14.0624

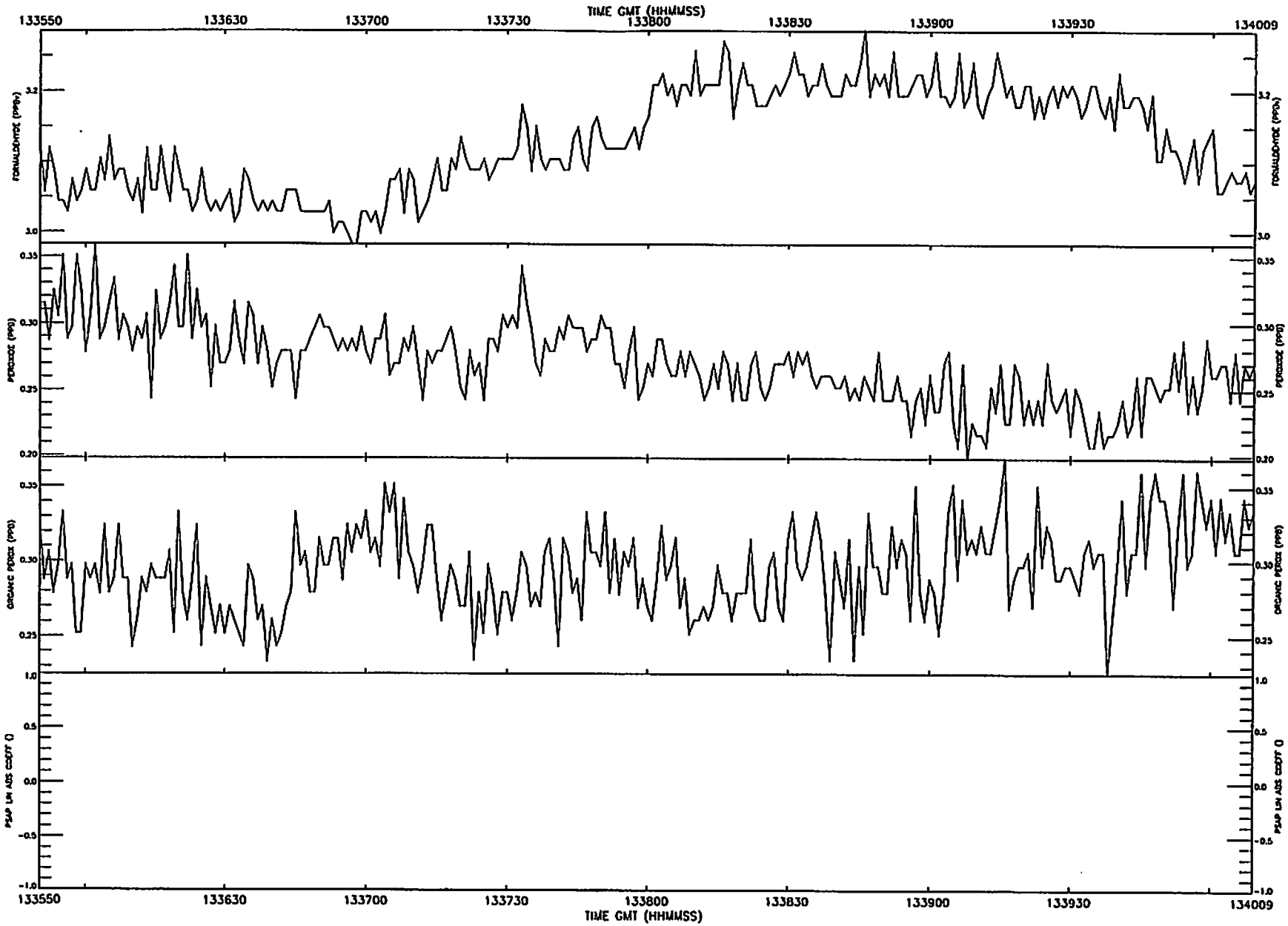
A579 20-SEP-97 R3 FL240 From 133550-134009 *Plotted 7-May-1998 10:11*



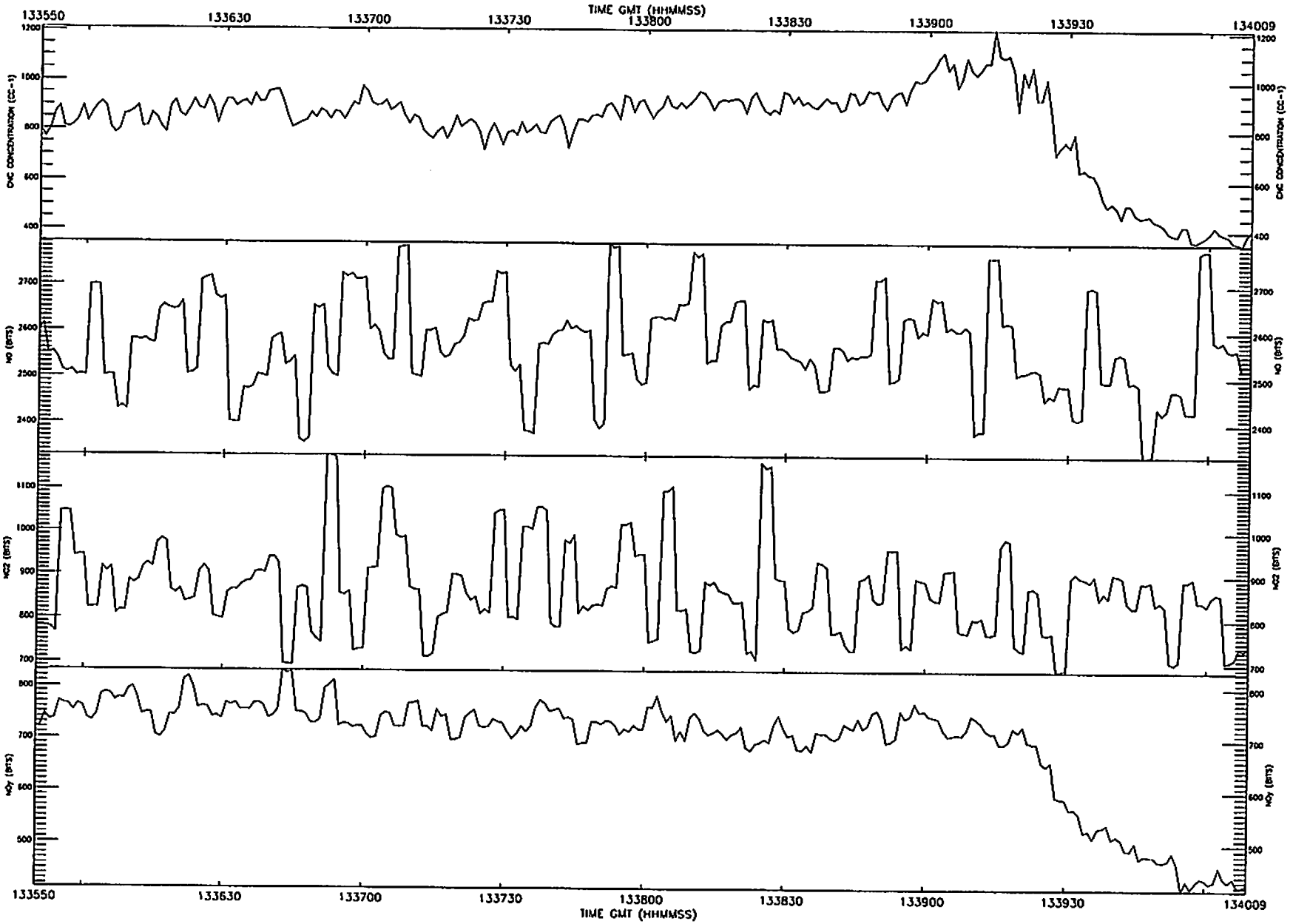
A579 20-SEP-97 R3 FL240 From 133550-134009 *Plotted 7-May-1998 10:11*



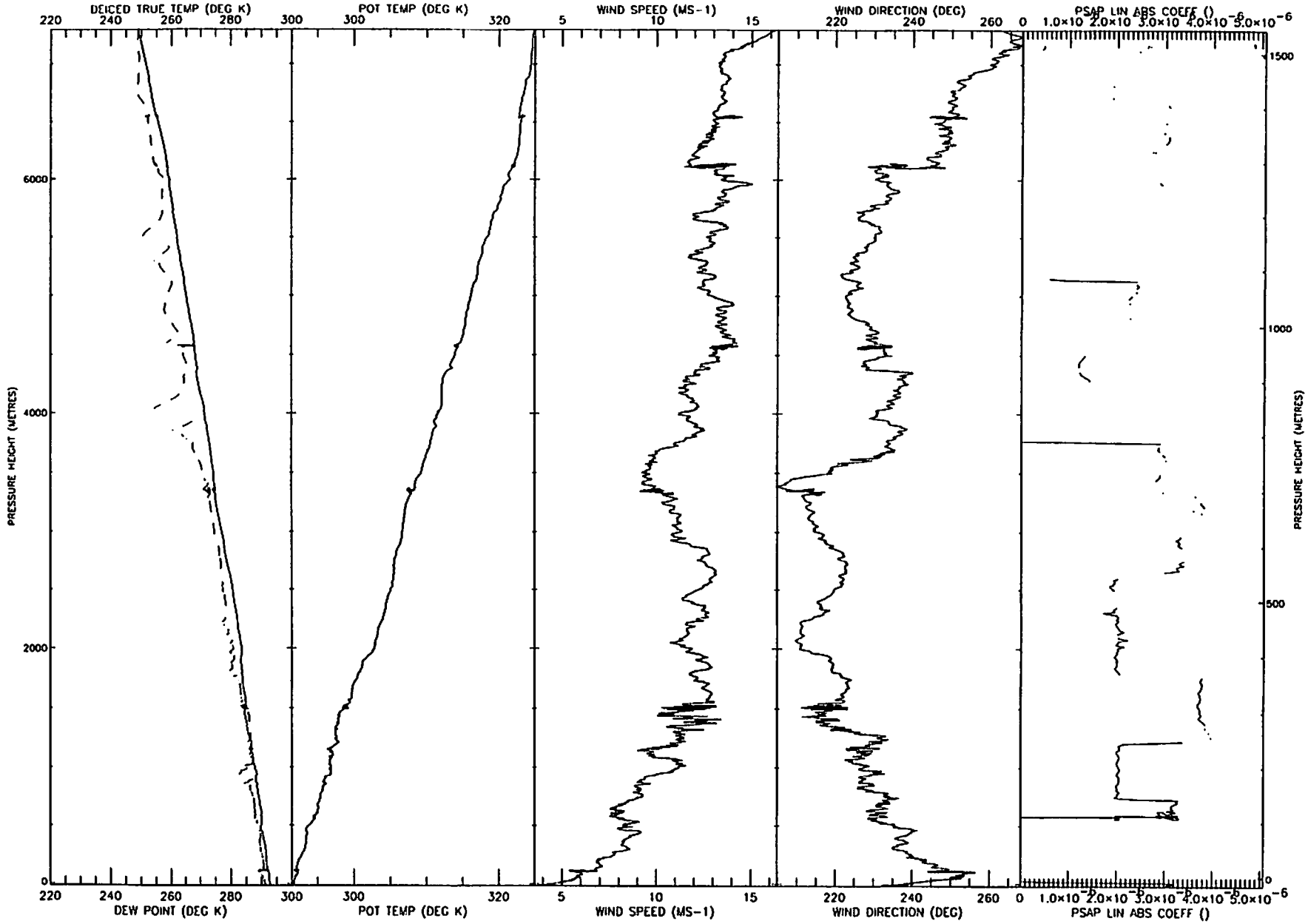
A579 20-SEP-97 R3 FL240 From 133550-134009 *Plotted 7-May-1998 10:11*



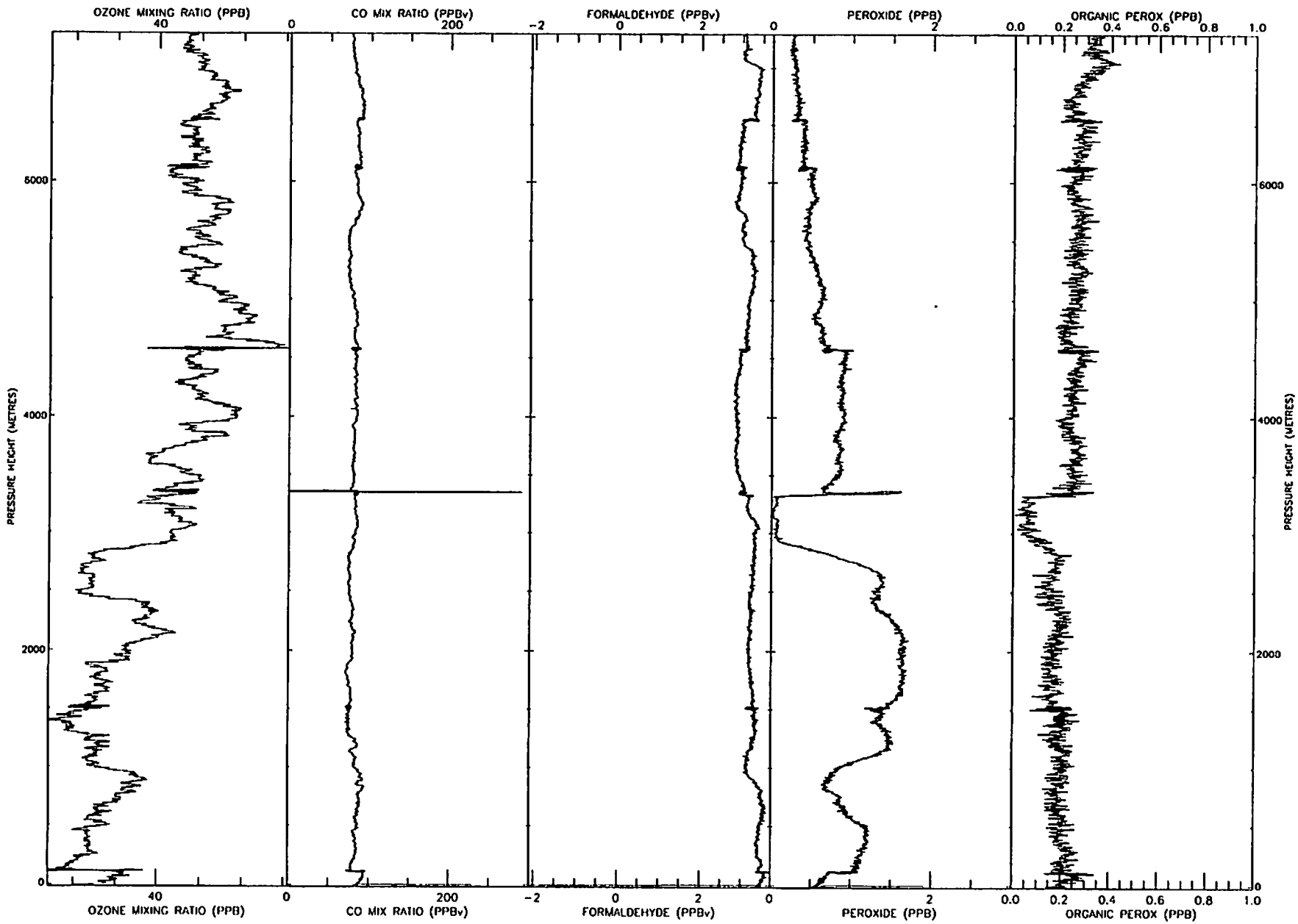
A579 20-SEP-97 R3 FL240 From 133550-134009 *Plotted 7-May-1998 10:11*



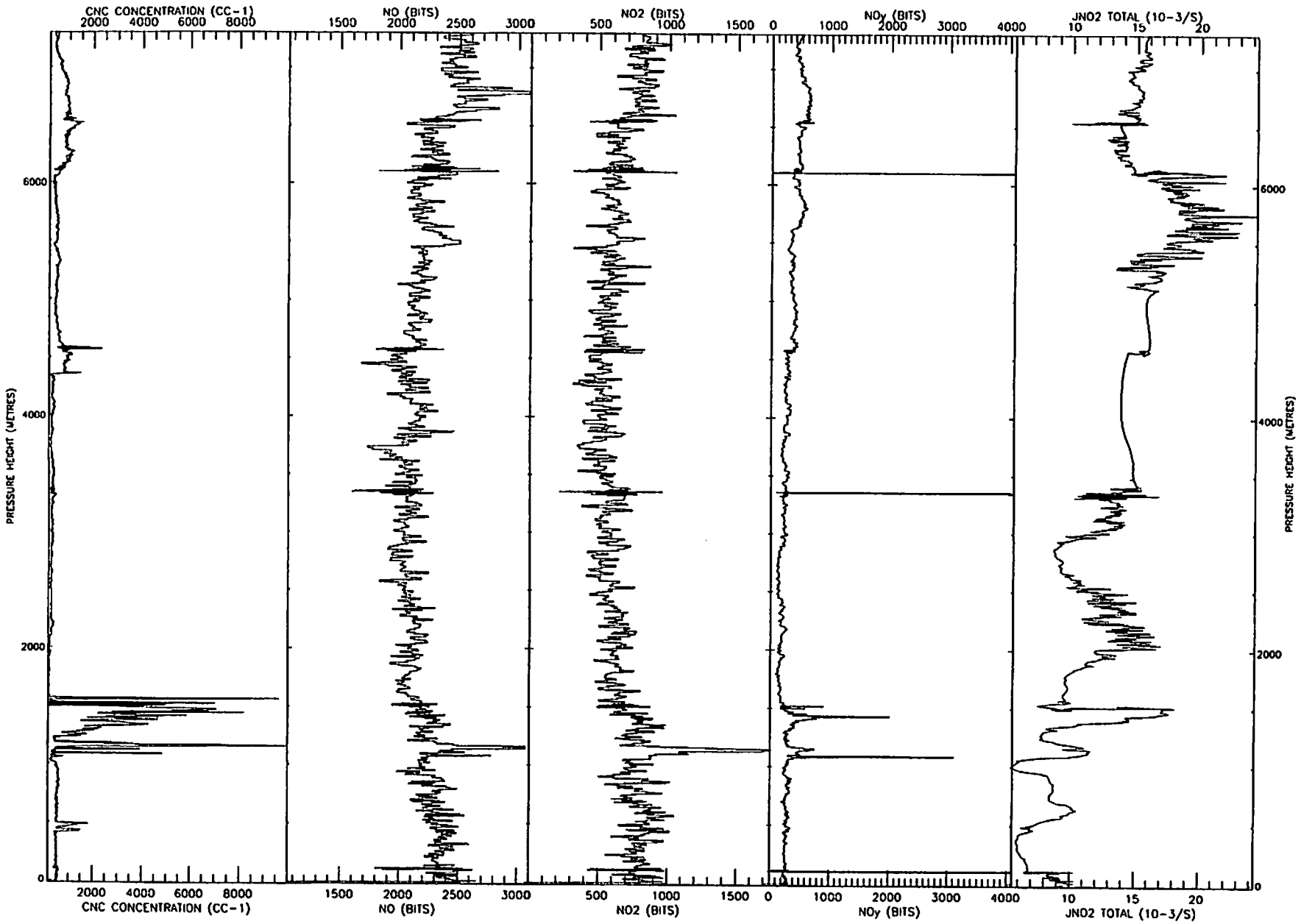
A579 20-SEP-97 P4 FL240-50' R/FL214/FL200/FL150/FL110/FL50/500' From 134009-142645 *Plotted*



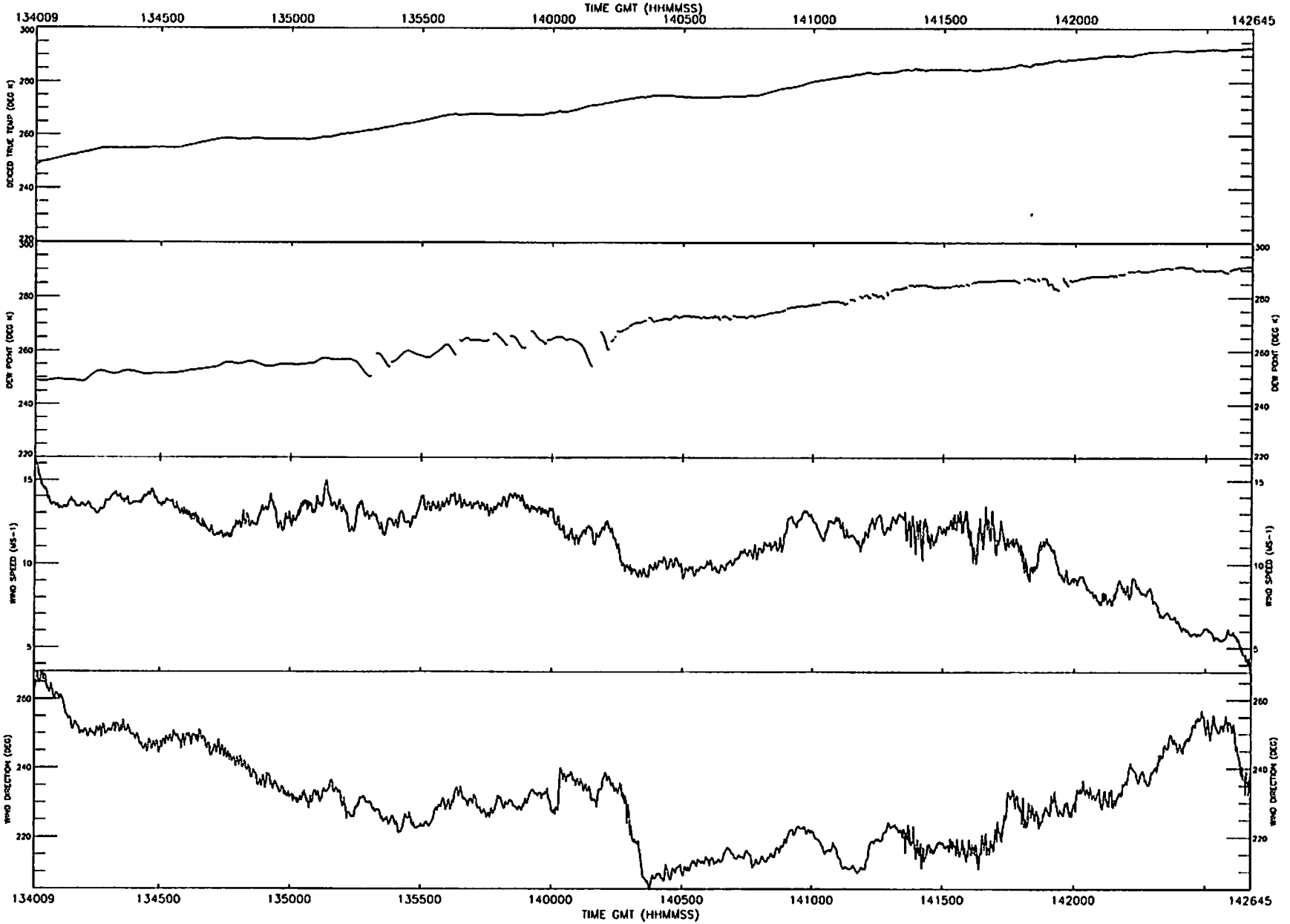
A579 20-SEP-97 P4 FL240-50' R/FL214/FL200/FL150/FL110/FL50/500' From 134009-142645 *Plotted*



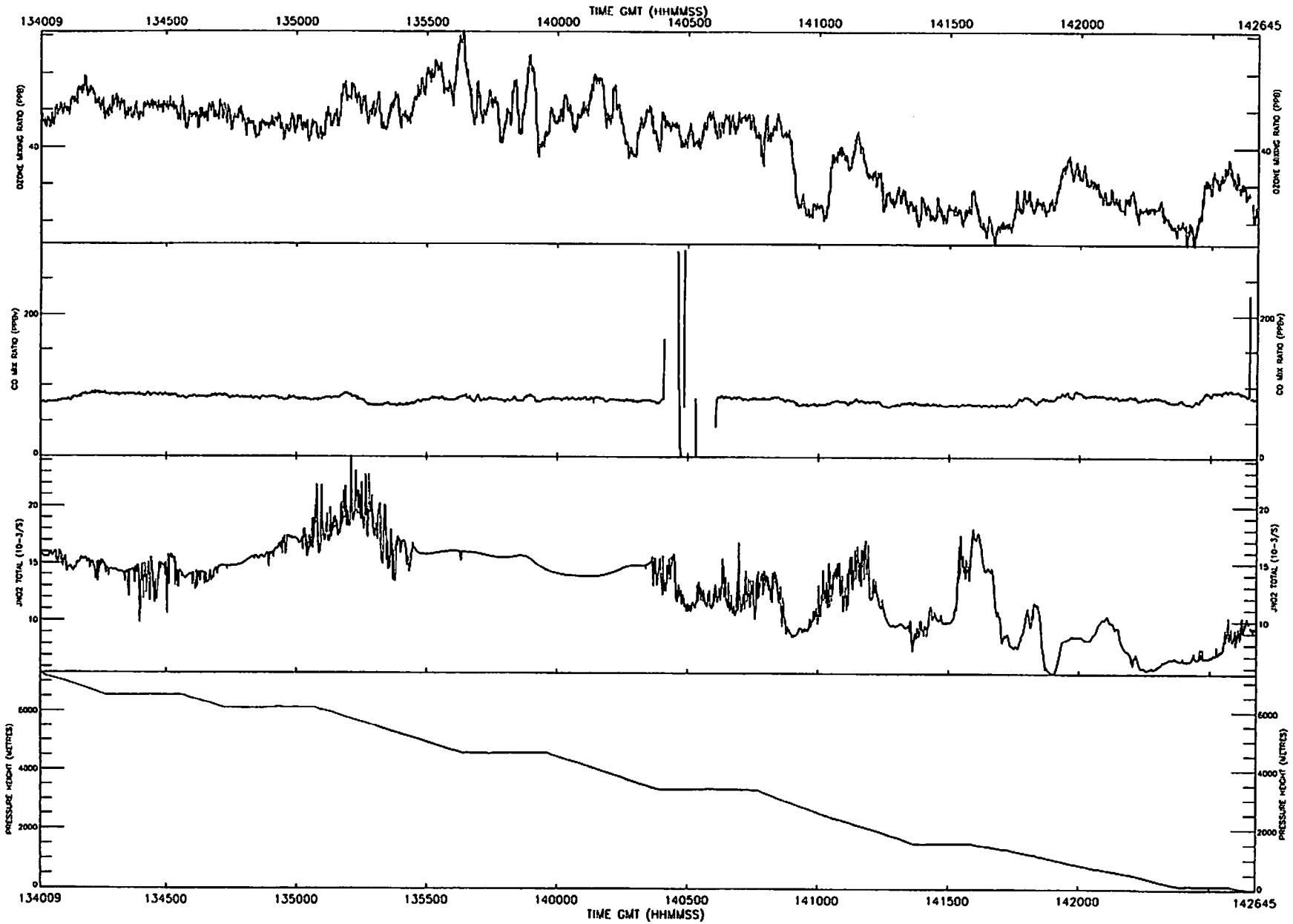
A579 20-SEP-97 P4 FL240-50' R/FL214/FL200/FL150/FL110/FL50/500' From 134009-142645 *Plotted*



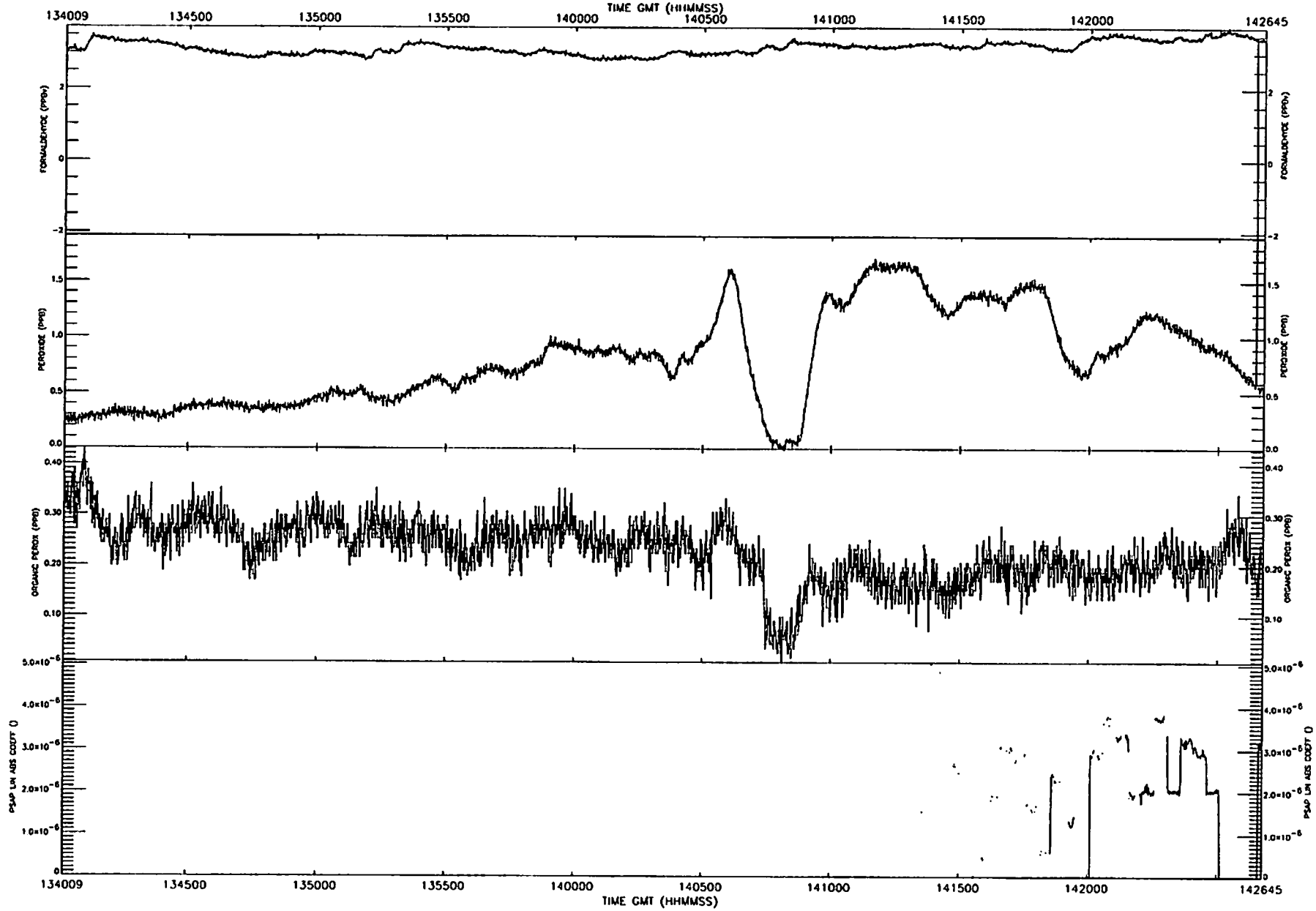
A579 20-SEP-97 P4 FL240-50' R/FL214/FL200/FL150/FL110/FL50/500' From 134009-142645 *Plotted*



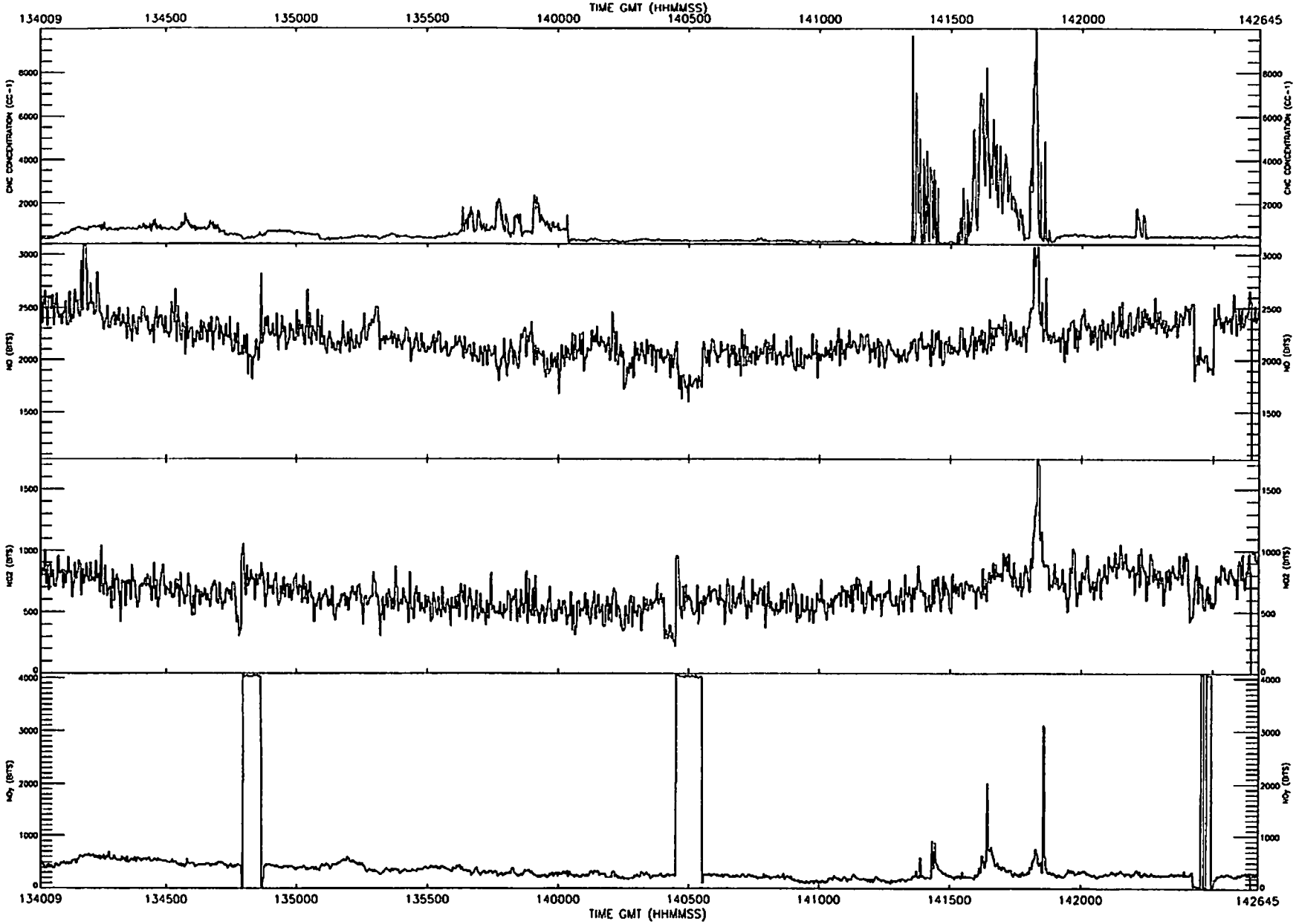
A579 20-SEP-97 P4 FL240-50' R/FL214/FL200/FL150/FL110/FL50/500' From 134009-142645 *Plotted*



A579 20-SEP-97 P4 FL240-50' R/FL214/FL200/FL150/FL110/FL50/500' From 134009-142645 *Plotted*



A579 20-SEP-97 P4 FL240-50' R/FL214/FL200/FL150/FL110/FL50/500' From 134009-142645 *Plotted*



A579 20-SEP-97 P4 FL240-50' R/FL214/FL200/FL150/FL110/FL50/500' From 134009-142645 *Plotted*

STATIC PRESSURE (MB)
No of obs 2795
Mean 670.943
Standard dev 190.135
Max value 1015.29
Min value 393.872

DEICED TRUE TEMP (DEG K)
No of obs 2795
Mean 272.872
Standard dev 12.8114
Max value 292.809
Min value 248.984

DEW POINT (DEG K)
No of obs 2795
Mean 269.870
Standard dev 13.9094
Max value 291.406
Min value 248.582

OZONE MIXING RATIO (PPB)
No of obs 2795
Mean 40.1901
Standard dev 6.22813
Max value 55.5115
Min value 1.000000e-38

PSAP LIN ABS COEFF ()
No of obs 2795
Mean 2.820765e-07
Standard dev 8.577042e-07
Max value 5.066657e-06
Min value -1.046657e-09

JNO2 TOTAL (10-3/S)
No of obs 2795
Mean 12.9321
Standard dev 3.45515
Max value 24.3381
Min value 3.04958

PRESSURE HEIGHT (METRES)
No of obs 2795
Mean 3598.47
Standard dev 2213.18
Max value 7294.28
Min value -16.9650

CORRECTED LATITUDE (DEGREES)
No of obs 2795
Mean 43.6198
Standard dev 1.16404
Max value 44.0132
Min value -16.7734

CORRECTED LONGITUDE (DEGREES)
No of obs 2795
Mean -24.3215
Standard dev 1.14126
Max value 0.330634
Min value -26.0195

NORTHWARD WIND COMPT (M S-1)
No of obs 2795
Mean 7.03786
Standard dev 2.62767
Max value 60.3088
Min value 0.493263

EASTWARD WIND COMPT (M S-1)
No of obs 2795
Mean 8.73682
Standard dev 3.25110
Max value 116.090
Min value 2.96931

VERTICAL WIND COMPT (M S-1)
No of obs 2795
Mean 0.316579
Standard dev 4.08685
Max value 214.463
Min value -1.12012

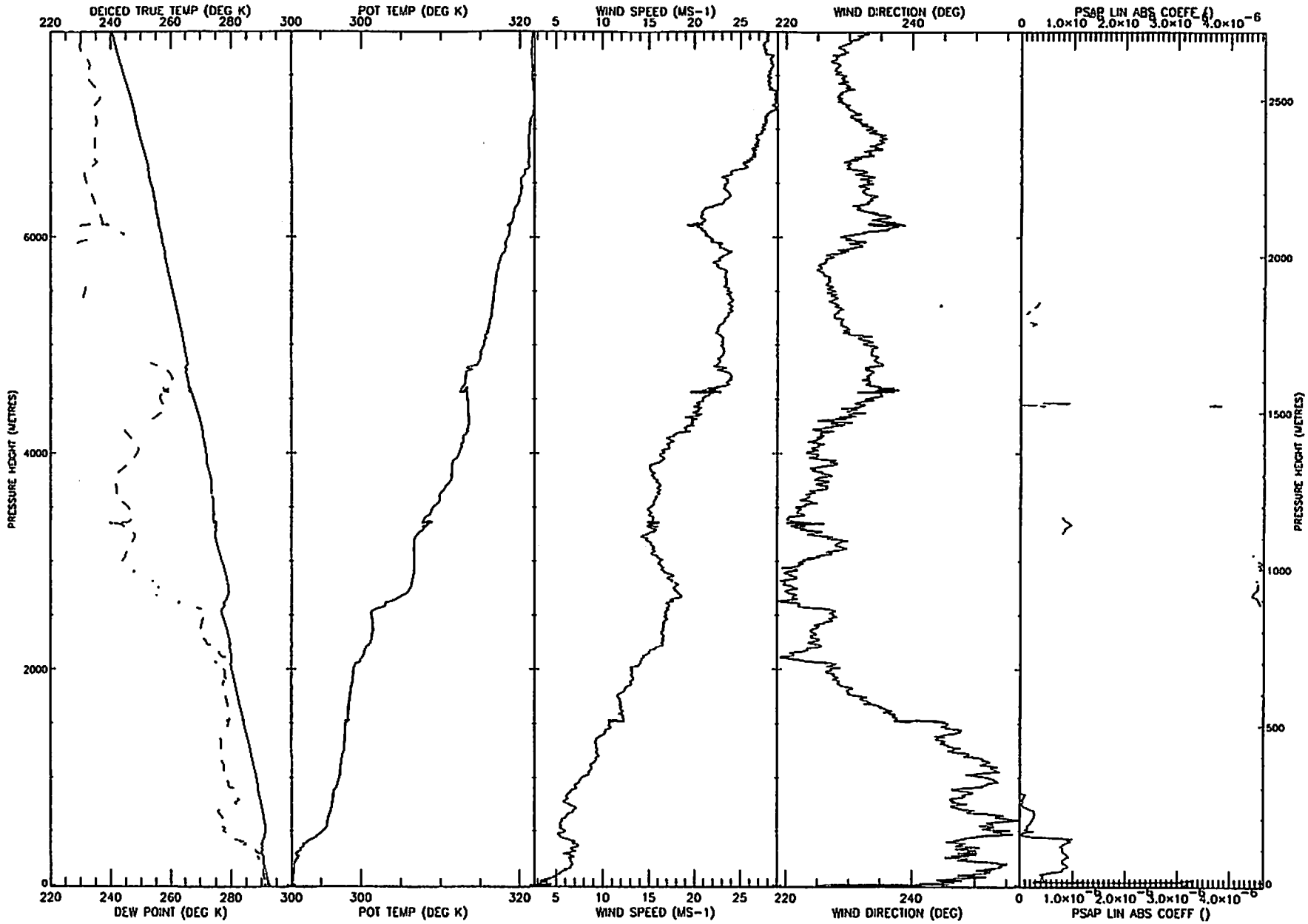
WIND SPEED (MS-1)
No of obs 2794
Mean 11.4924
Standard dev 2.27670
Max value 16.3910
Min value 3.55165

WIND DIRECTION (DEG)
Mean 231.147

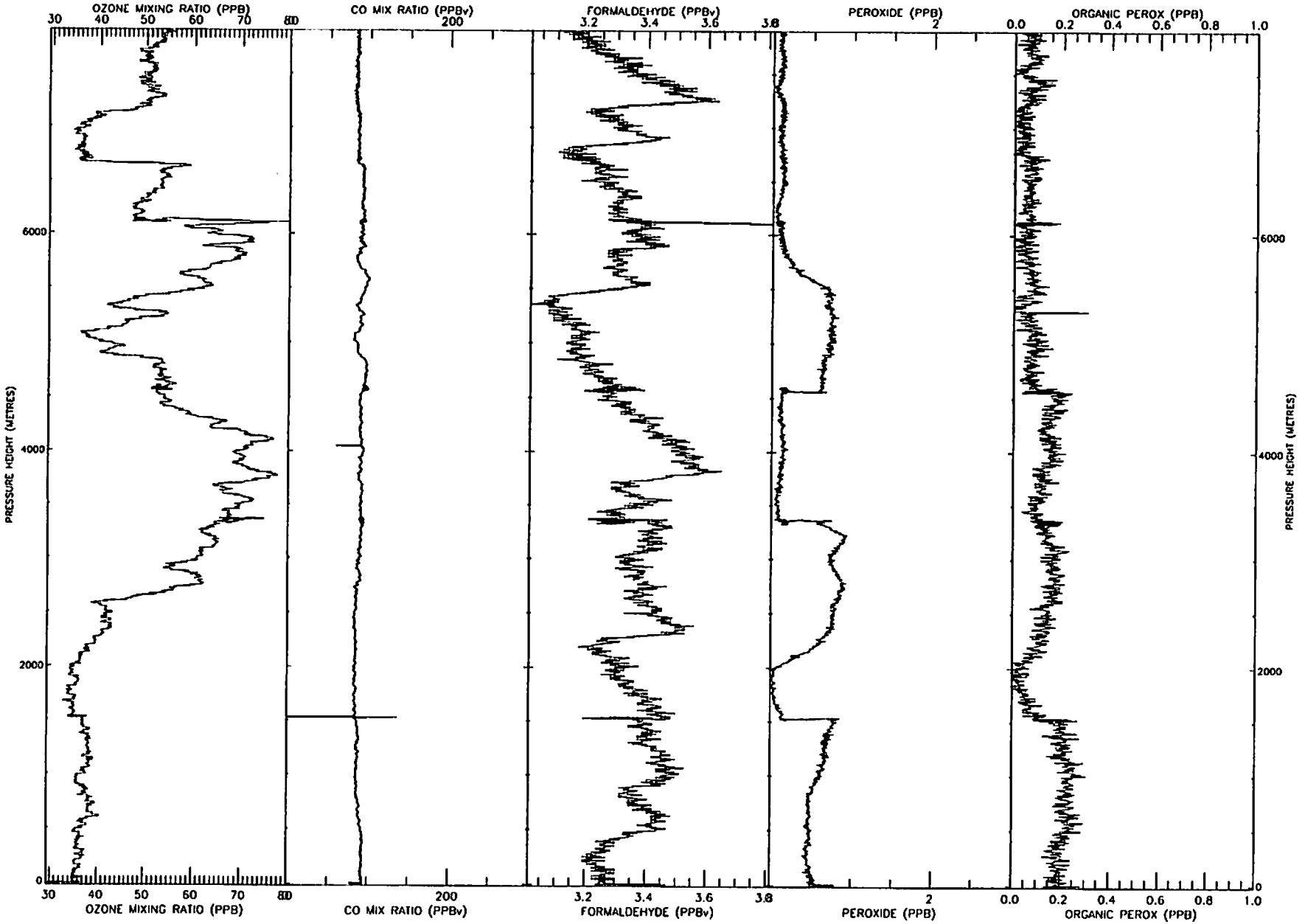
TRUE AIR SPEED (M S-1)
No of obs 2795
Mean 114.981
Standard dev 13.7256
Max value 139.382
Min value 91.8745

HEADING (DEG)
Mean 284.147

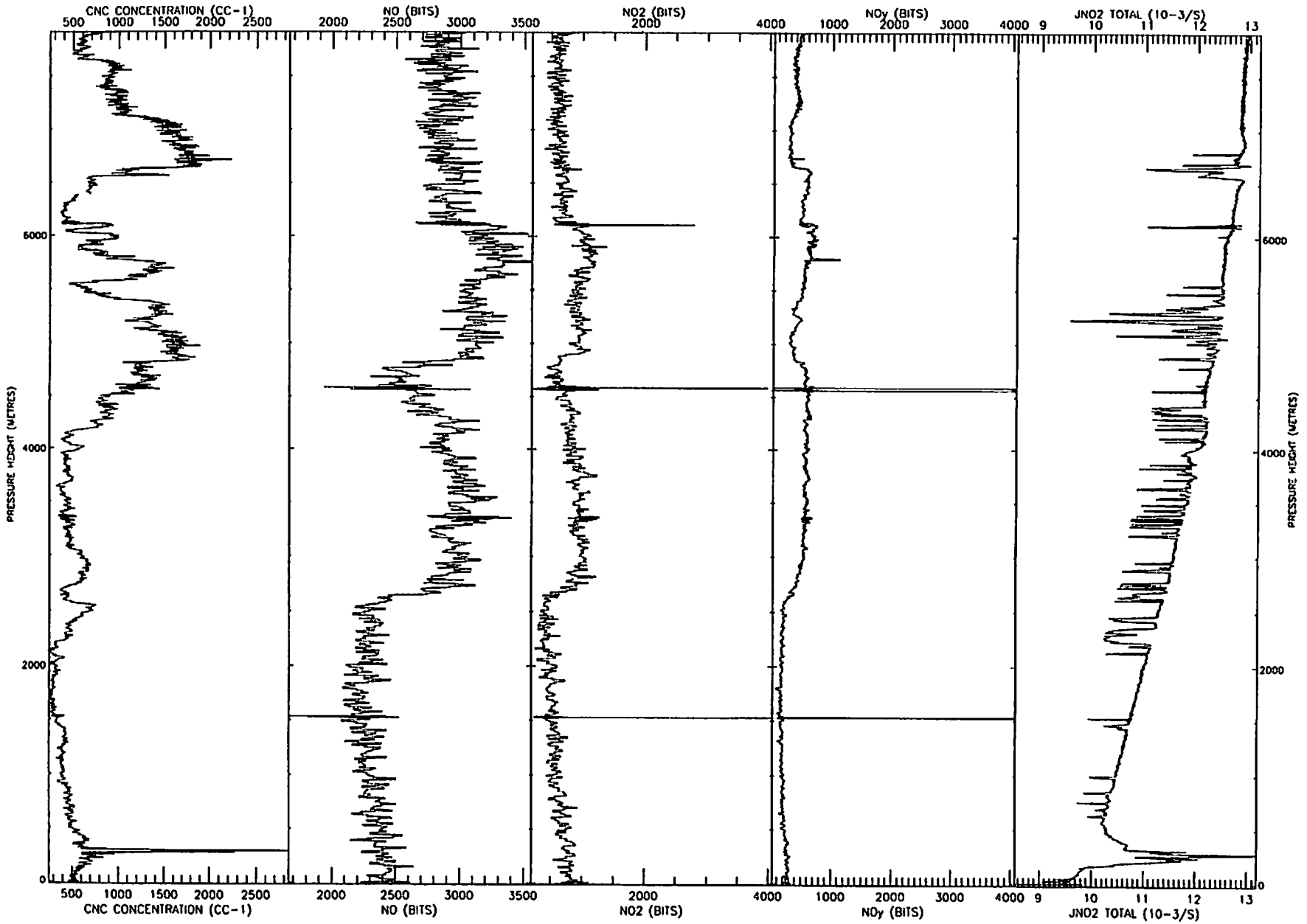
A579 20-SEP-97 P5 50' FL260 R/100'/FL50/FL110/FL150/FL200 From 142645-151323 *Plotted 7-May-*



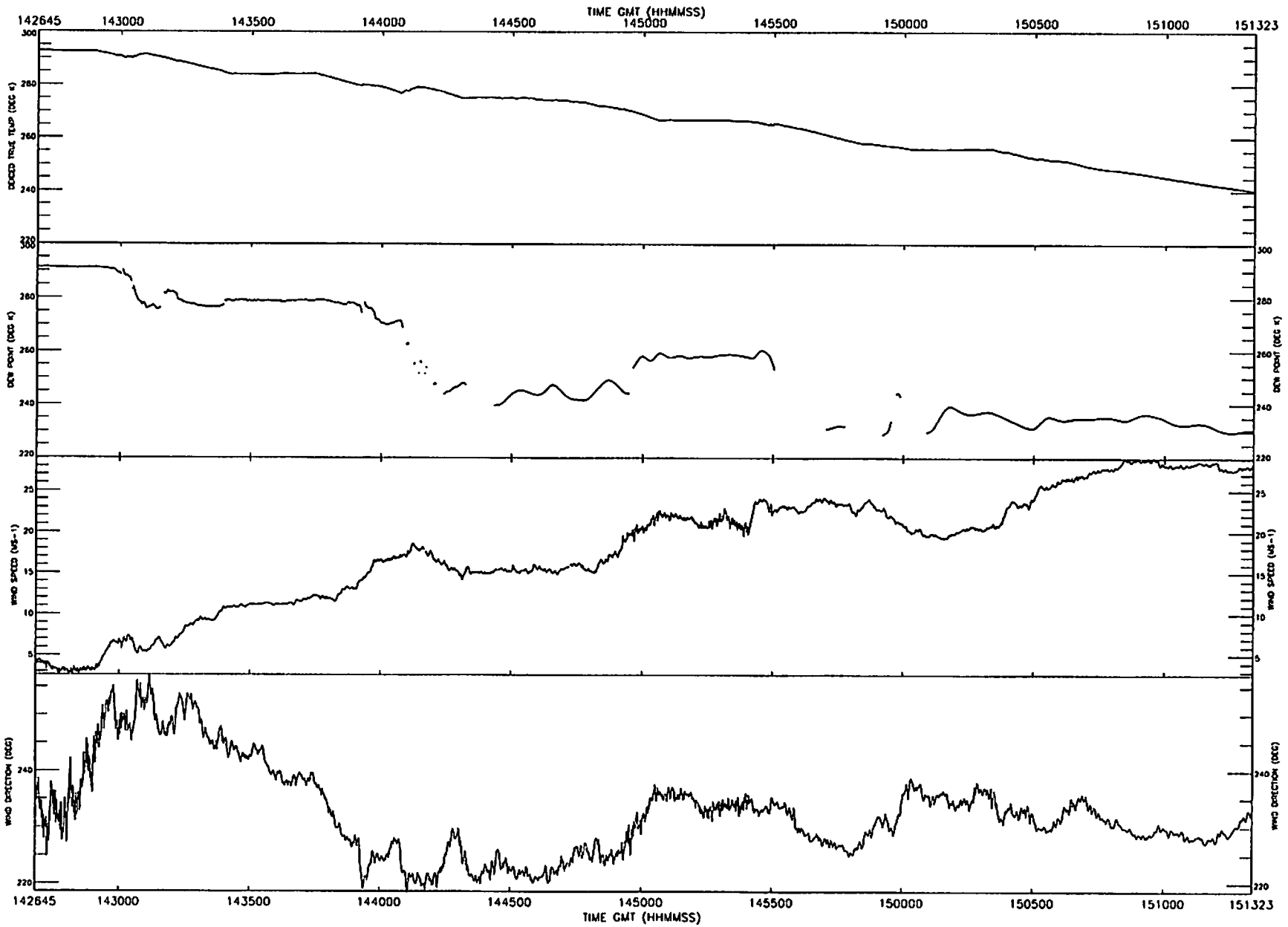
A579 20-SEP-97 P5 50' FL260 R/100'/FL50/FL110/FL150/FL200 From 142645-151323 *Plotted 7-May-*



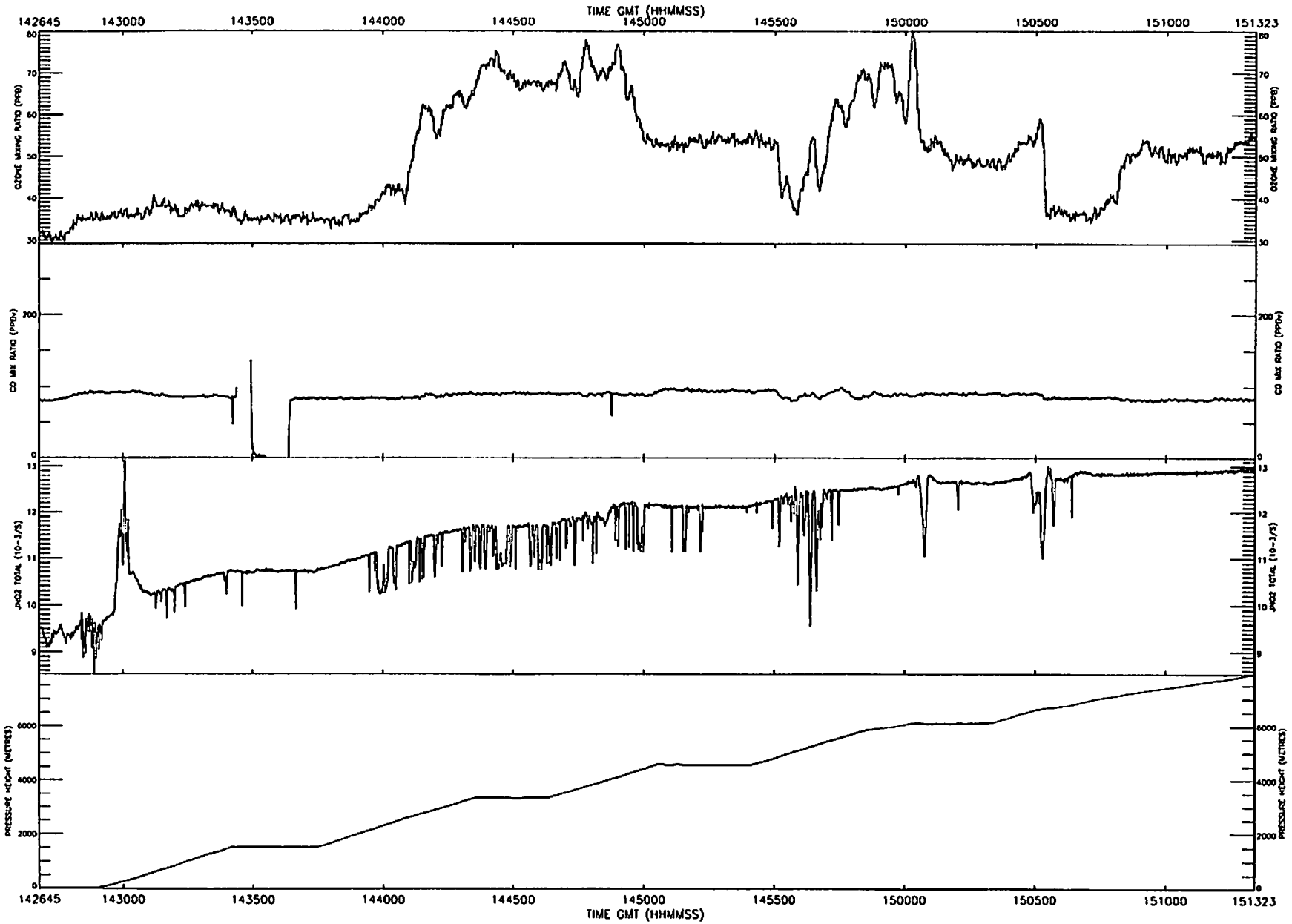
A579 20-SEP-97 P5 50' FL260 R/100'/FL50/FL110/FL150/FL200 From 142645-151323 *Plotted 7-May-*



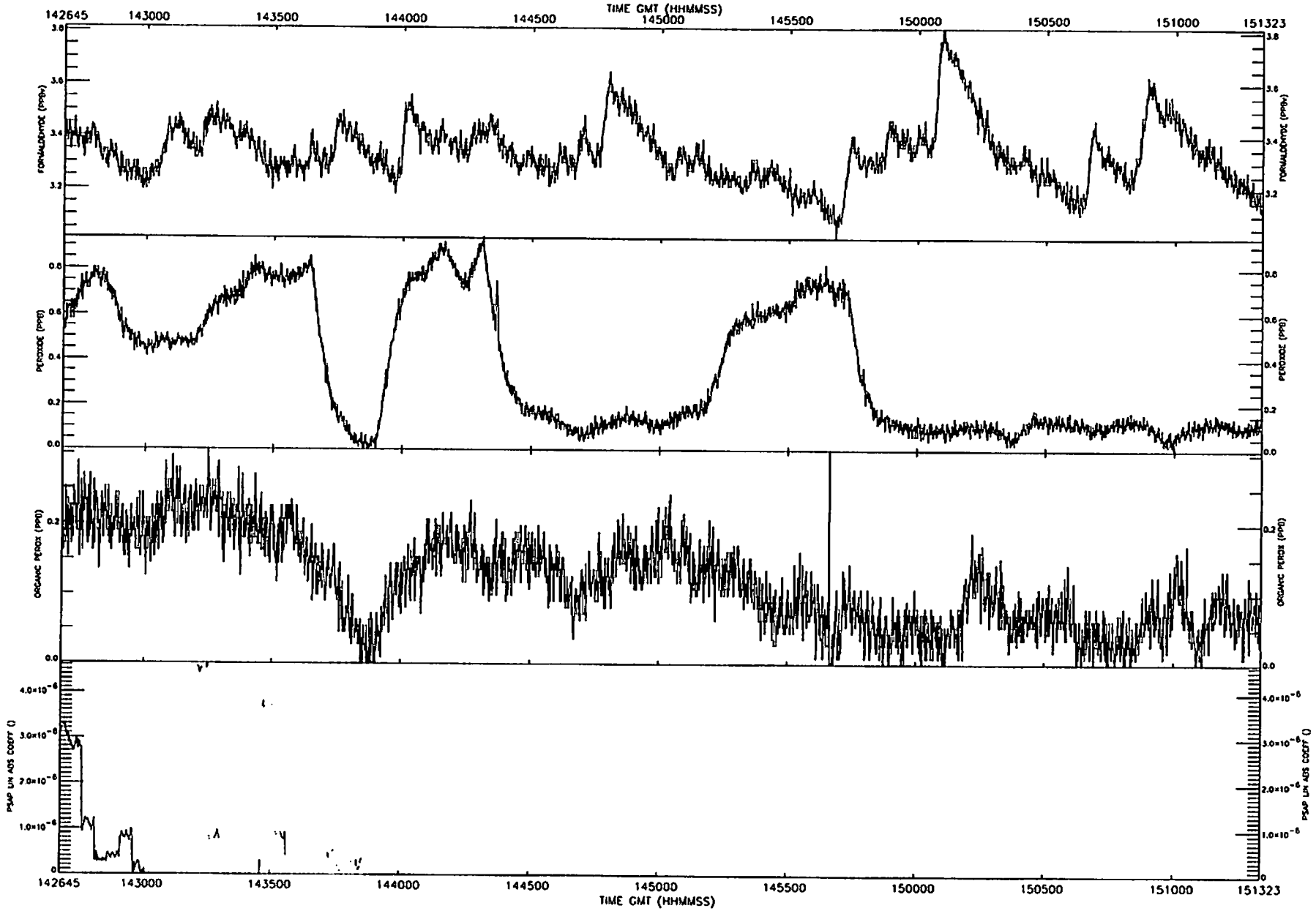
A579 20-SEP-97 P5 50' FL260 R/100'/FL50/FL110/FL150/FL200 From 142645-151323 *Plotted 7-May-*



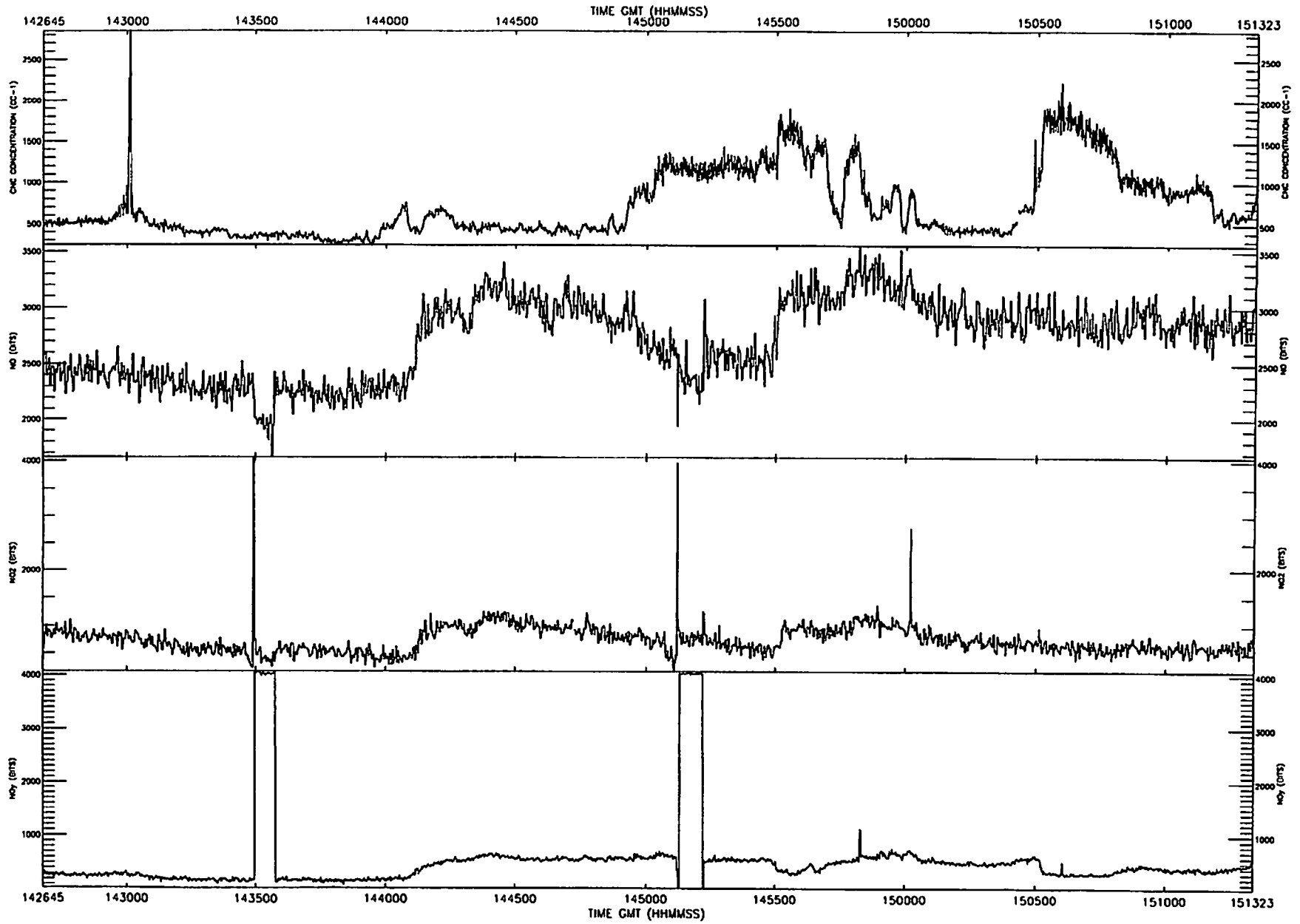
A579 20-SEP-97 P5 50' FL260 R/100'/FL50/FL110/FL150/FL200 From 142645-151323 *Plotted 7-May-*



A579 20-SEP-97 P5 50' FL260 R/100'/FL50/FL110/FL150/FL200 From 142645-151323 *Plotted 7-May-*



A579 20-SEP-97 P5 50' FL260 R/100'/FL50/FL110/FL150/FL200 From 142645-151323 *Plotted 7-May-*



A579 20-SEP-97 P5 50' FL260 R/100'/FL50/FL110/FL150/FL200 From 142645-151323 *Plotted 7-May-*

STATIC PRESSURE (MB)
No of obs 2793
Mean 634.628
Standard dev 195.591
Max value 1015.29
Min value 361.032

DEICED TRUE TEMP (DEG K)
No of obs 2793
Mean 268.721
Standard dev 15.0766
Max value 292.792
Min value 240.409

DEW POINT (DEG K)
No of obs 2793
Mean 253.355
Standard dev 20.2810
Max value 291.422
Min value 228.700

OZONE MIXING RATIO (PPB)
No of obs 2793
Mean 49.6542
Standard dev 12.4937
Max value 80.0247
Min value 29.2482

PSAP LIN ABS COEFF ()
No of obs 2793
Mean 1.369276e-07
Standard dev 5.984715e-07
Max value 4.651471e-06
Min value -1.046657e-09

JNO2 TOTAL (10-3/S)
No of obs 2793
Mean 11.6887
Standard dev 1.01752
Max value 13.1808
Min value 8.53150

PRESSURE HEIGHT (METRES)
No of obs 2793
Mean 4069.33
Standard dev 2360.20
Max value 7902.69
Min value -16.9650

CORRECTED LATITUDE (DEGREES)
No of obs 2793
Mean 44.0773
Standard dev 2.526658e-02
Max value 44.1105
Min value 44.0132

CORRECTED LONGITUDE (DEGREES)
No of obs 2793
Mean -27.7132
Standard dev 1.02732
Max value -26.0195
Min value -29.5506

NORTHWARD WIND COMPT (M S-1)
No of obs 2793
Mean 11.1859
Standard dev 5.04662
Max value 19.3549
Min value 1.25158

EASTWARD WIND COMPT (M S-1)
No of obs 2793
Mean 13.9526
Standard dev 5.46495
Max value 22.3849
Min value 2.11194

VERTICAL WIND COMPT (M S-1)
No of obs 2793
Mean -0.758201
Standard dev 0.533150
Max value 0.386215
Min value -1.87614

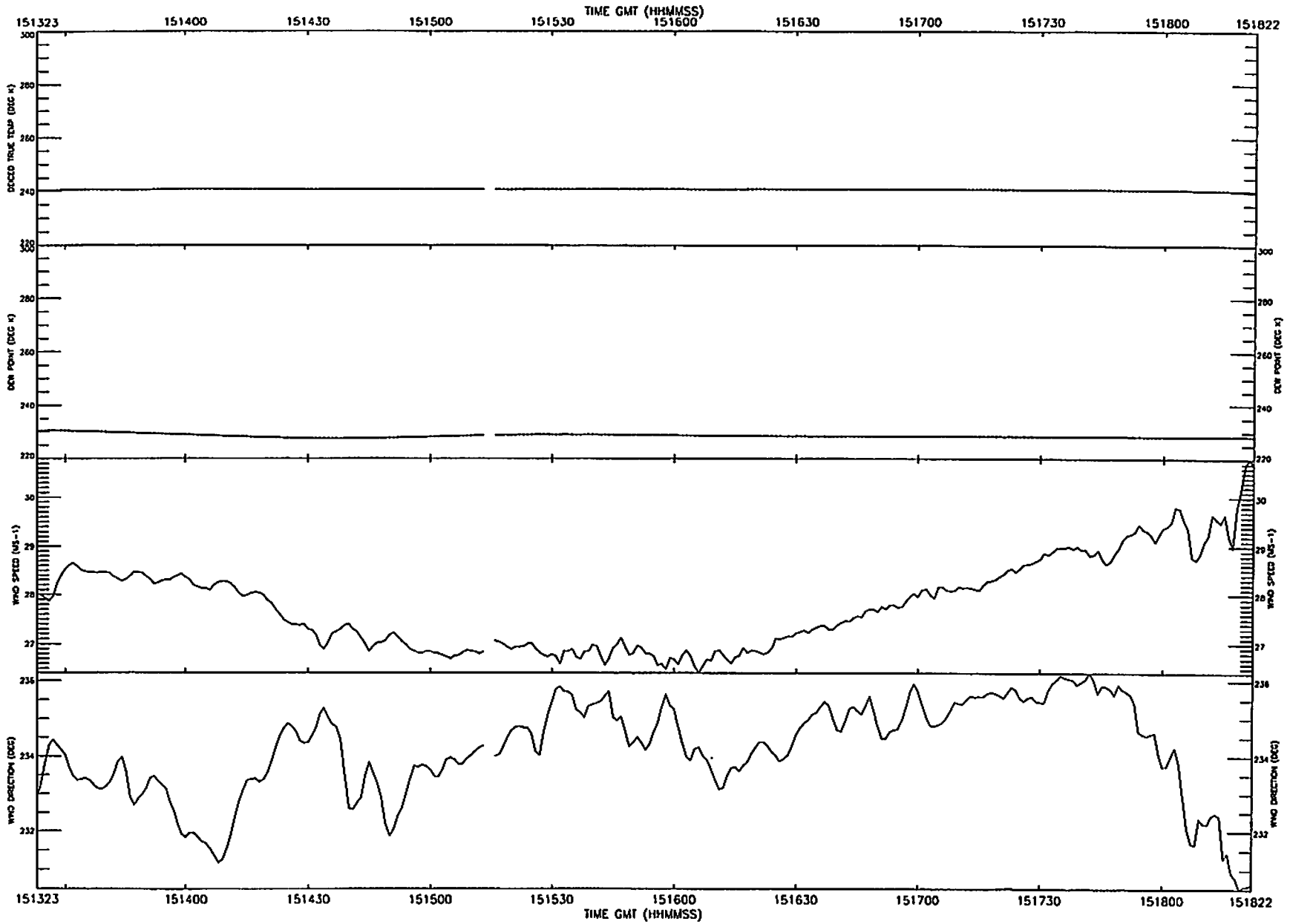
WIND SPEED (MS-1)
No of obs 2793
Mean 17.9879
Standard dev 7.18098
Max value 29.0112
Min value 2.64457

WIND DIRECTION (DEG)
Mean 231.280

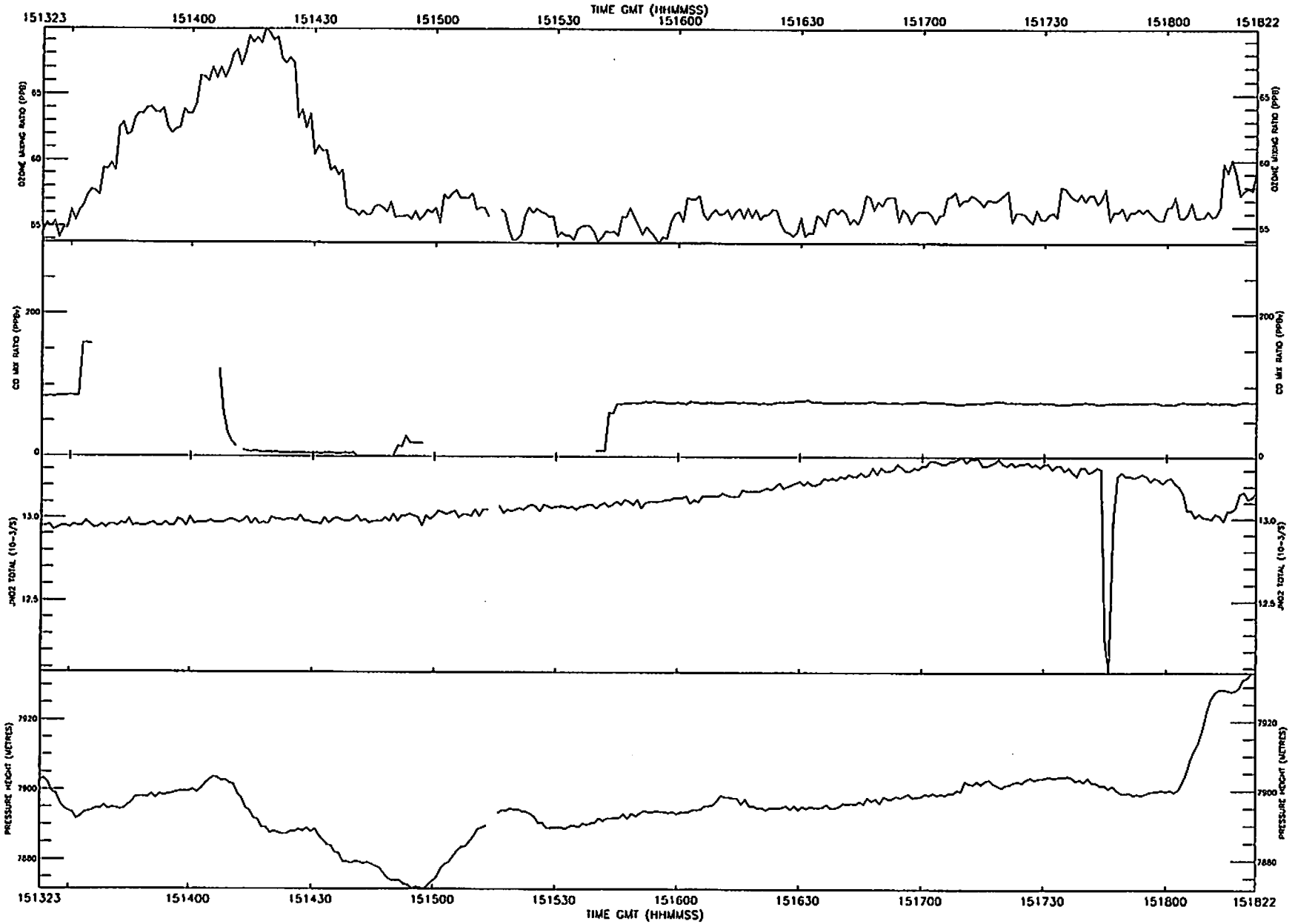
TRUE AIR SPEED (M S-1)
No of obs 2793
Mean 116.277
Standard dev 13.6091
Max value 145.708
Min value 92.8148

HEADING (DEG)
Mean 270.542

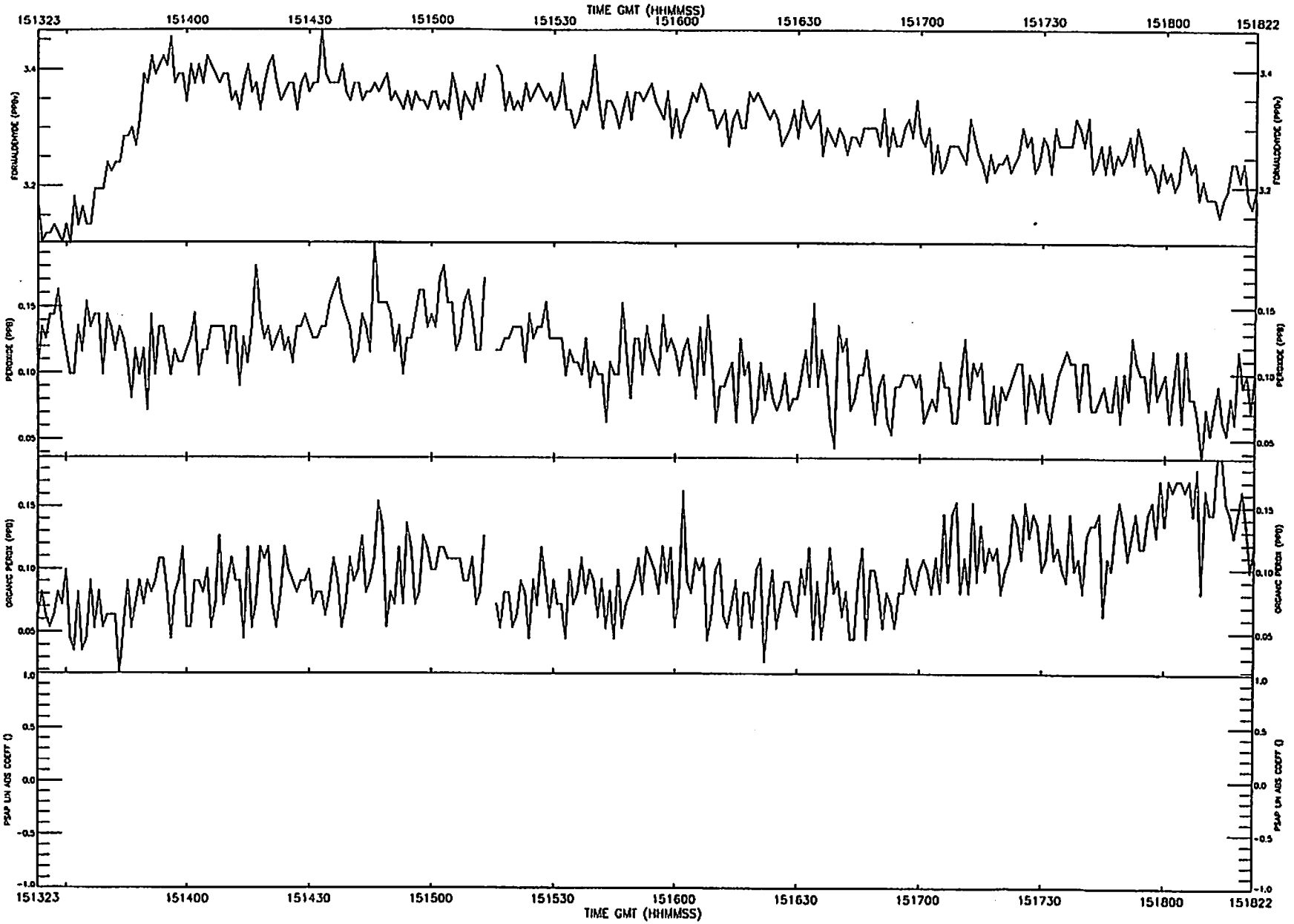
A579 20-SEP-97 R4 FL260 From 151323-151822 *Plotted 7-May-1998 10:34*



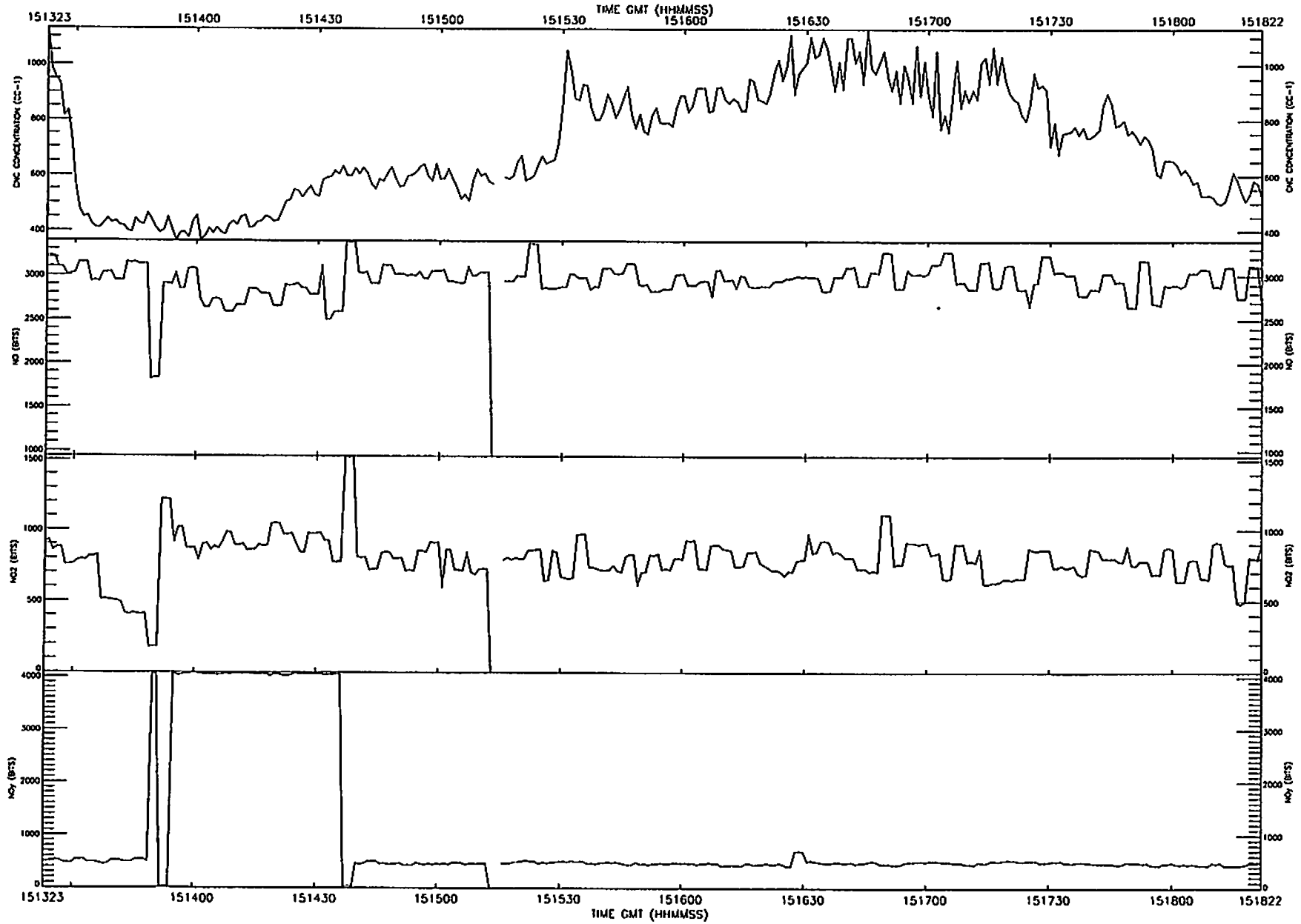
A579 20-SEP-97 R4 FL260 From 151323-151822 *Plotted 7-May-1998 10:34*



A579 20-SEP-97 R4 FL260 From 151323-151822 *Plotted 7-May-1998 10:34*



A579 20-SEP-97 R4 FL260 From 151323-151822 *Plotted 7-May-1998 10:34*



STATIC PRESSURE (MB)
No of obs 298
Mean 361.388
Standard dev 0.552293
Max value 362.654
Min value 359.410

DEICED TRUE TEMP (DEG K)
No of obs 298
Mean 240.736
Standard dev 0.110157
Max value 240.863
Min value 240.332

DEW POINT (DEG K)
No of obs 298
Mean 228.669
Standard dev 0.611588
Max value 230.572
Min value 227.592

OZONE MIXING RATIO (PPB)
No of obs 298
Mean 57.7678
Standard dev 3.74622
Max value 69.8808
Min value 53.7835

PSAP LIN ABS COEFF ()
No of obs 298
Mean 1.000000e-38
Standard dev 0.000000
Max value 1.000000e-38
Min value 1.000000e-38

JNO2 TOTAL (10-3/S)
No of obs 298
Mean 13.1113
Standard dev 0.156675
Max value 13.3790
Min value 12.0695

PRESSURE HEIGHT (METRES)
No of obs 298
Mean 7895.87
Standard dev 10.5997
Max value 7933.89
Min value 7871.61

CORRECTED LATITUDE (DEGREES)
No of obs 298
Mean 44.0048
Standard dev 3.700909e-02
Max value 44.0378
Min value 43.9074

CORRECTED LONGITUDE (DEGREES)
No of obs 298
Mean -29.7438
Standard dev 0.104536
Max value -29.5506
Min value -29.8672

NORTHWARD WIND COMPT (M S-1)
No of obs 298
Mean 16.2771
Standard dev 0.821380
Max value 19.5611
Min value 14.9304

EASTWARD WIND COMPT (M S-1)
No of obs 298
Mean 22.5306
Standard dev 0.760037
Max value 24.1828
Min value 21.3774

VERTICAL WIND COMPT (M S-1)
No of obs 298
Mean -0.956717
Standard dev 0.245596
Max value -0.381386
Min value -1.67105

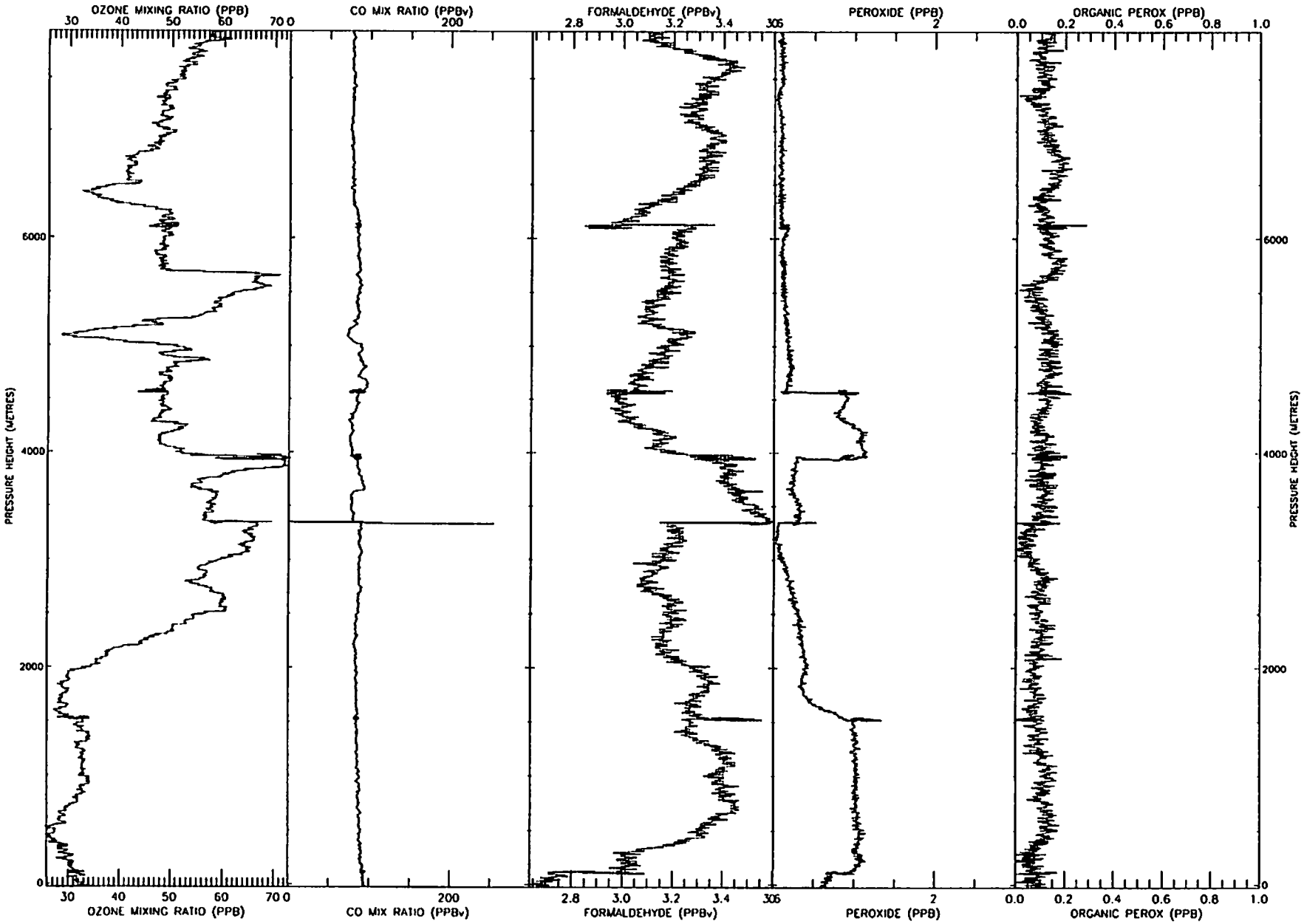
WIND SPEED (MS-1)
No of obs 298
Mean 27.8023
Standard dev 0.925743
Max value 30.8057
Min value 26.4143

WIND DIRECTION (DEG)
Mean 234.154

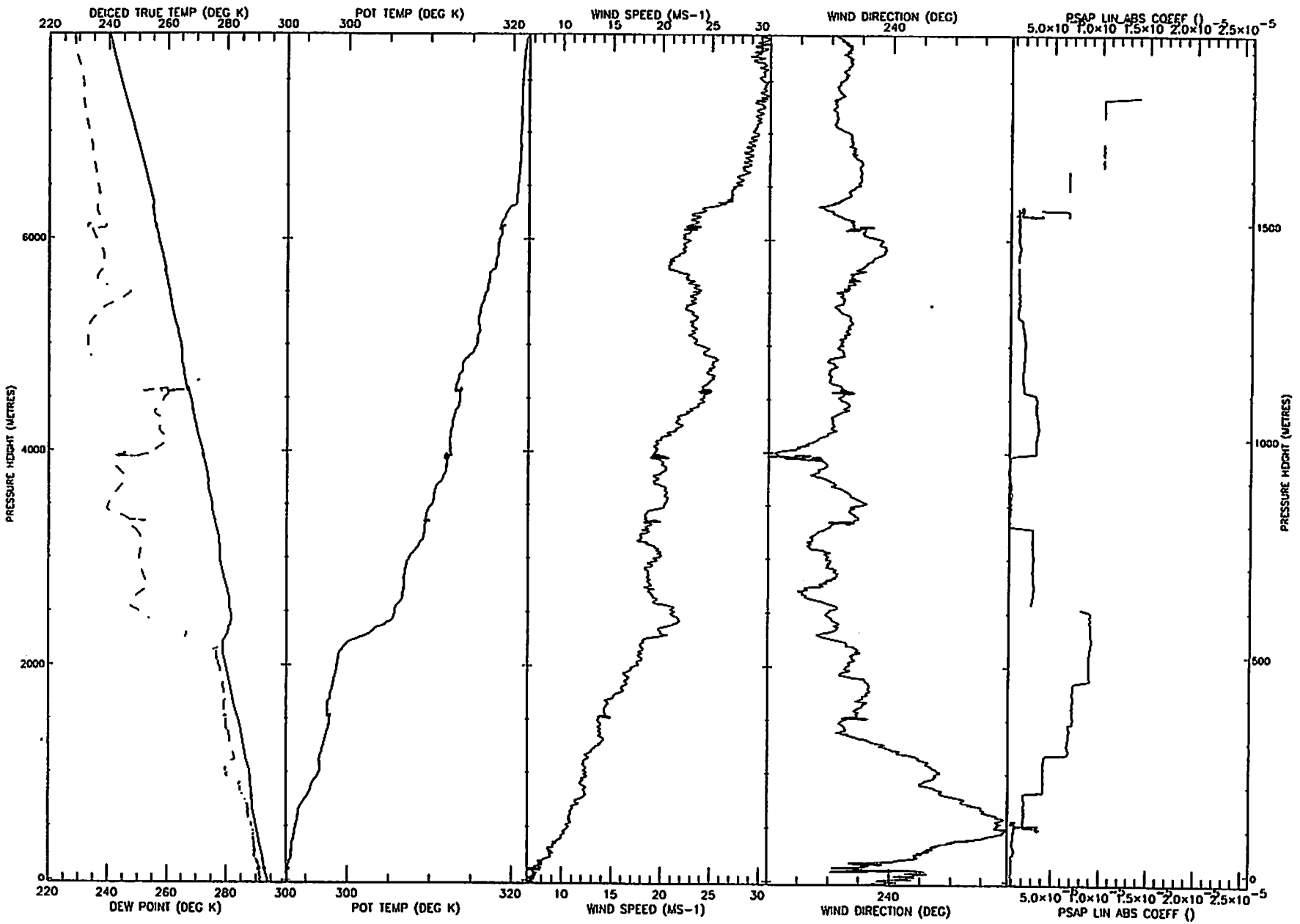
TRUE AIR SPEED (M S-1)
No of obs 298
Mean 140.566
Standard dev 5.84369
Max value 147.677
Min value 125.717

HEADING (DEG)
Mean 237.803

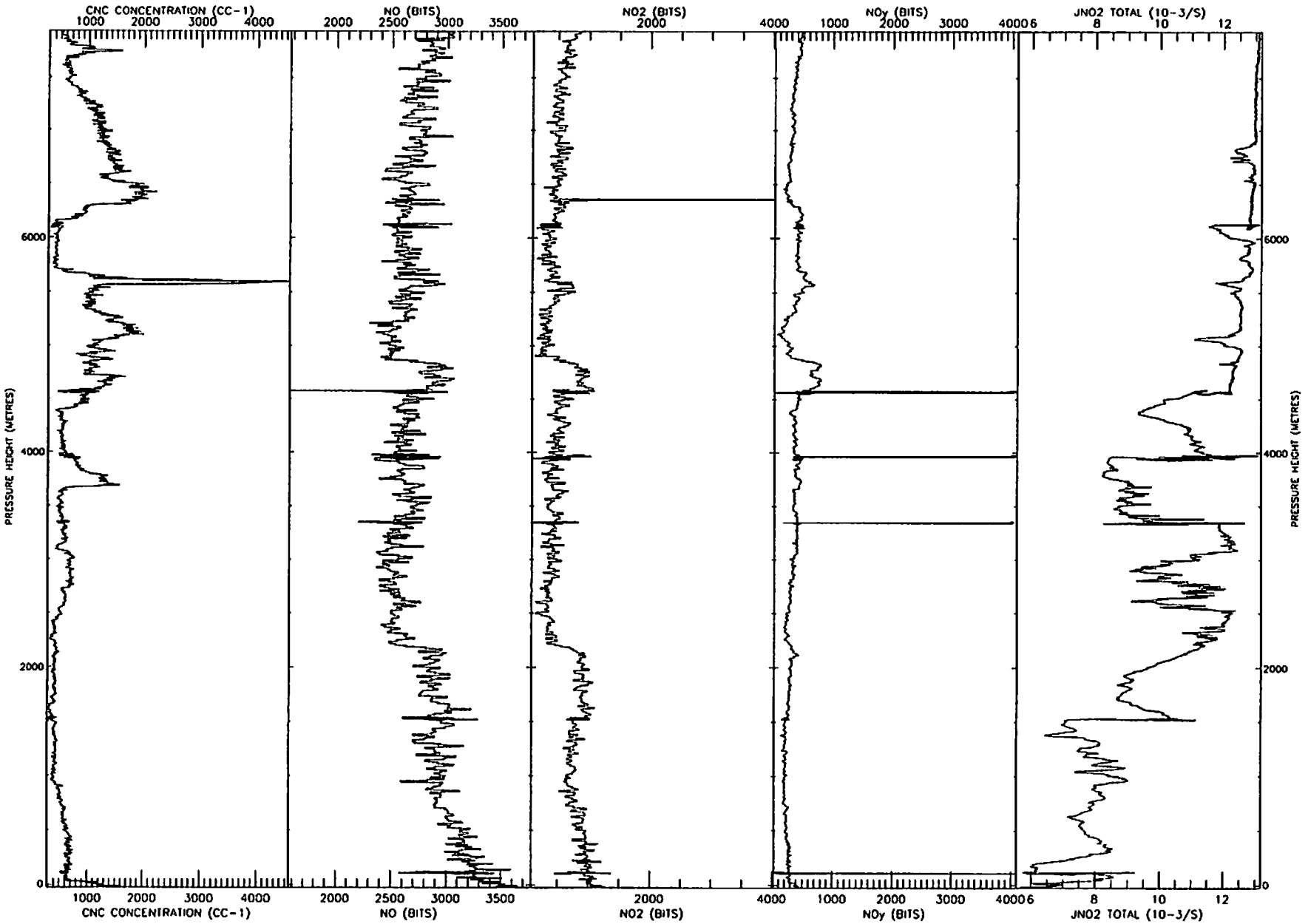
A579 20-SEP-97 P6 FL260-50' R/FL200/FL150/FL130/FL110/FL50/500' From 151822-160509 *Plotted*



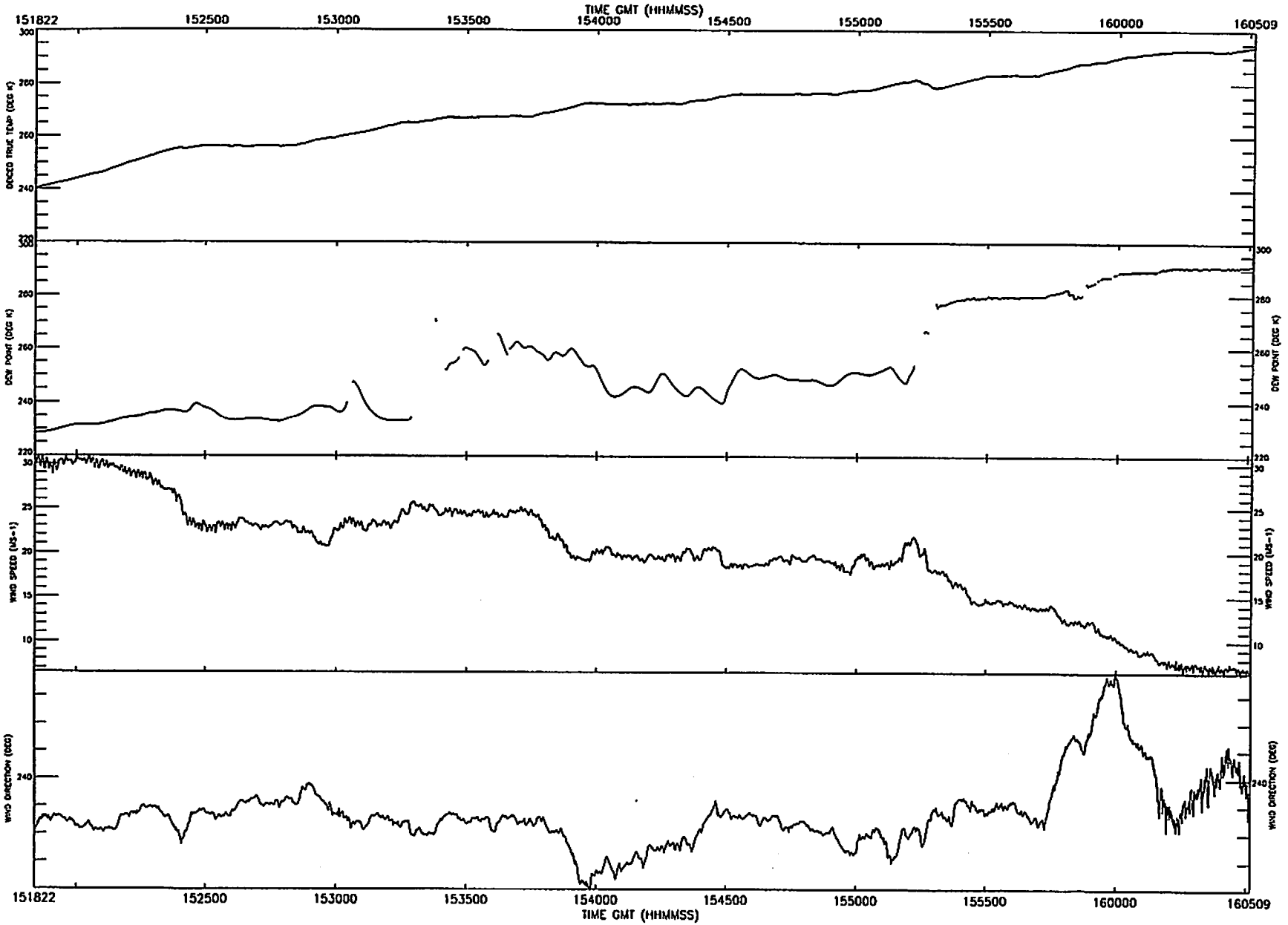
A579 20-SEP-97 P6 FL260-50' R/FL200/FL150/FL130/FL110/FL50/500' From 151822-160509 *Plotted*



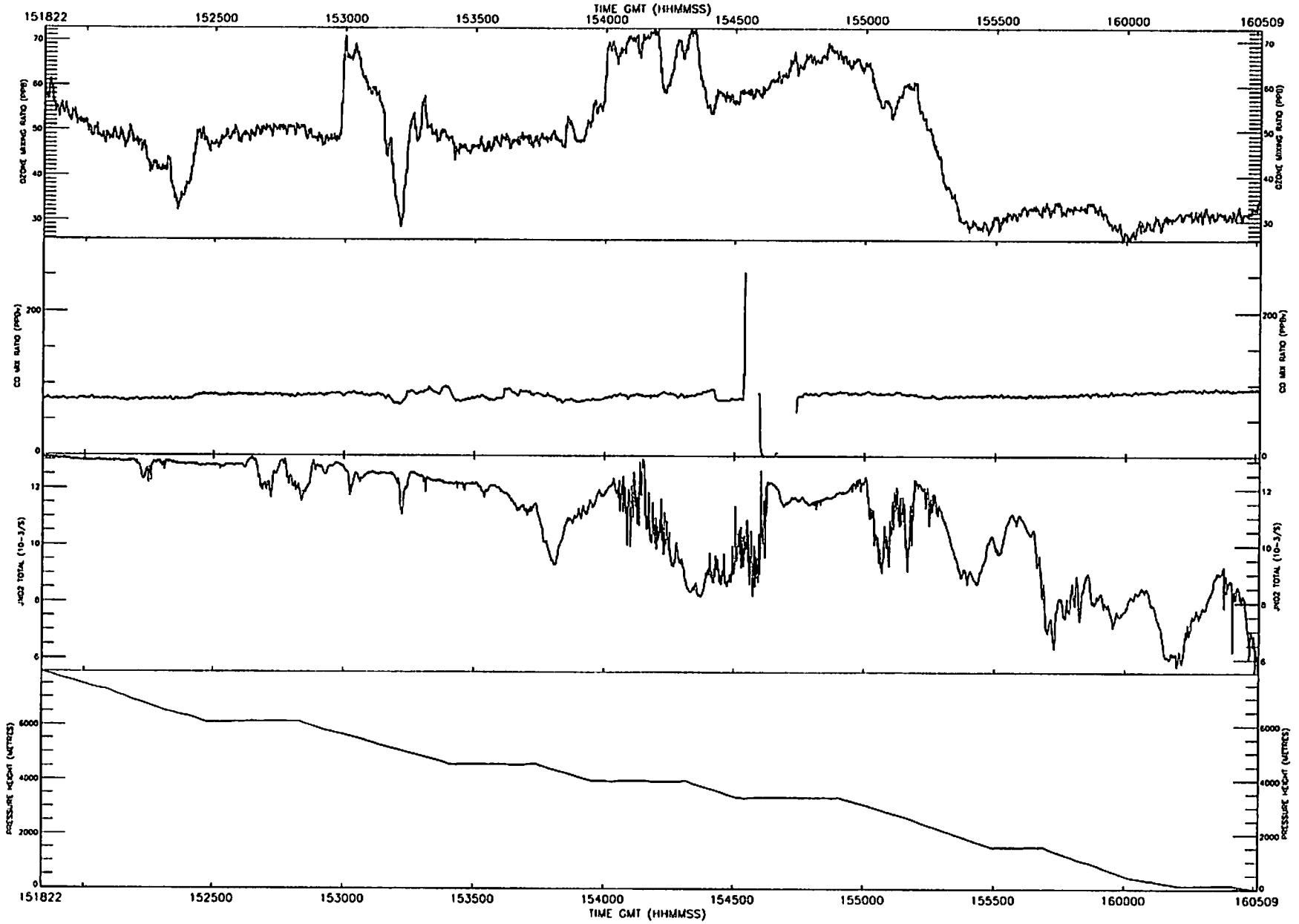
A579 20-SEP-97 P6 FL260-50' R/FL200/FL150/FL130/FL110/FL50/500' From 151822-160509 *Plotted*



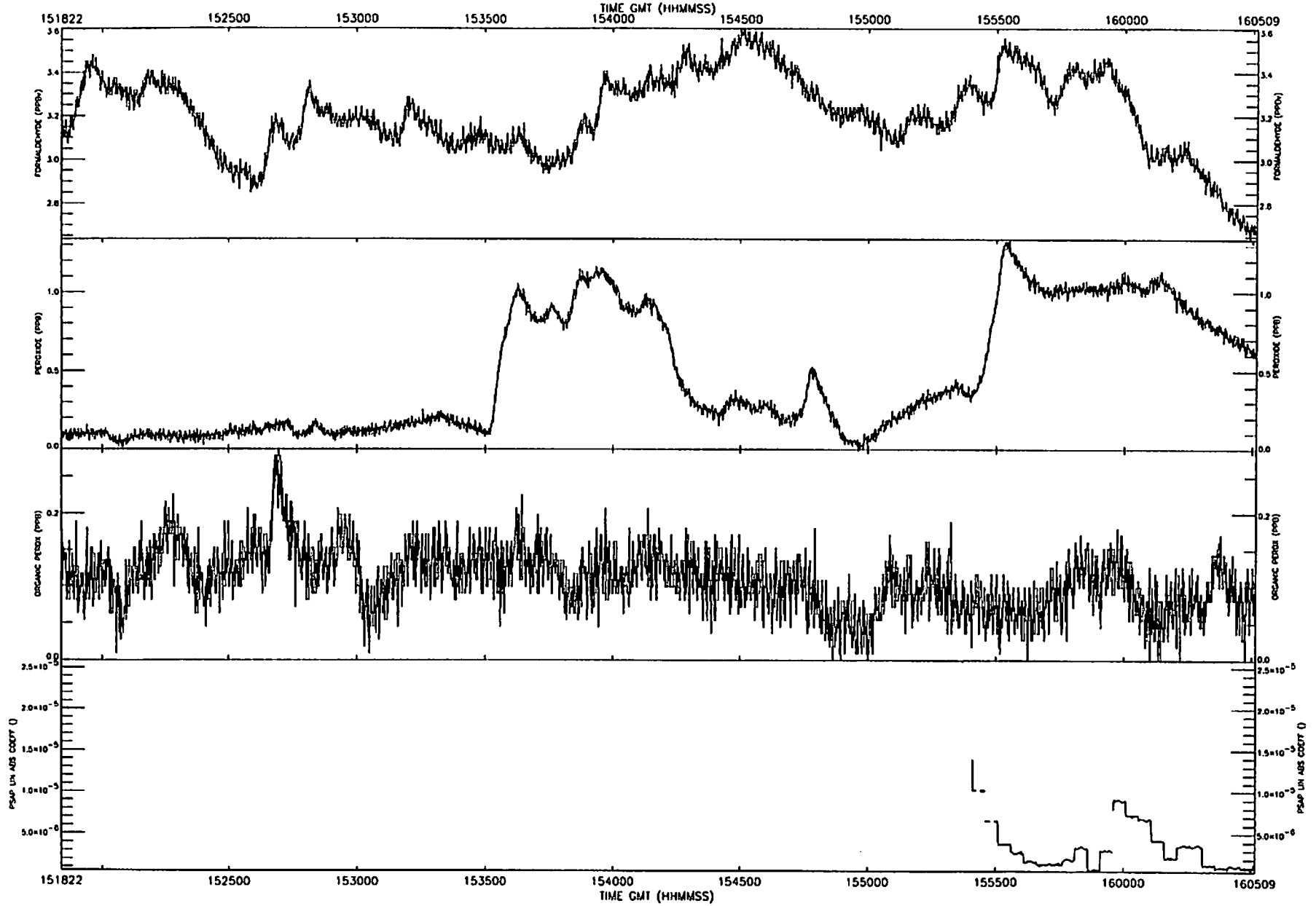
A579 20-SEP-97 P6 FL260-50' R/FL200/FL150/FL130/FL110/FL50/500' From 151822-160509 *Plotted*



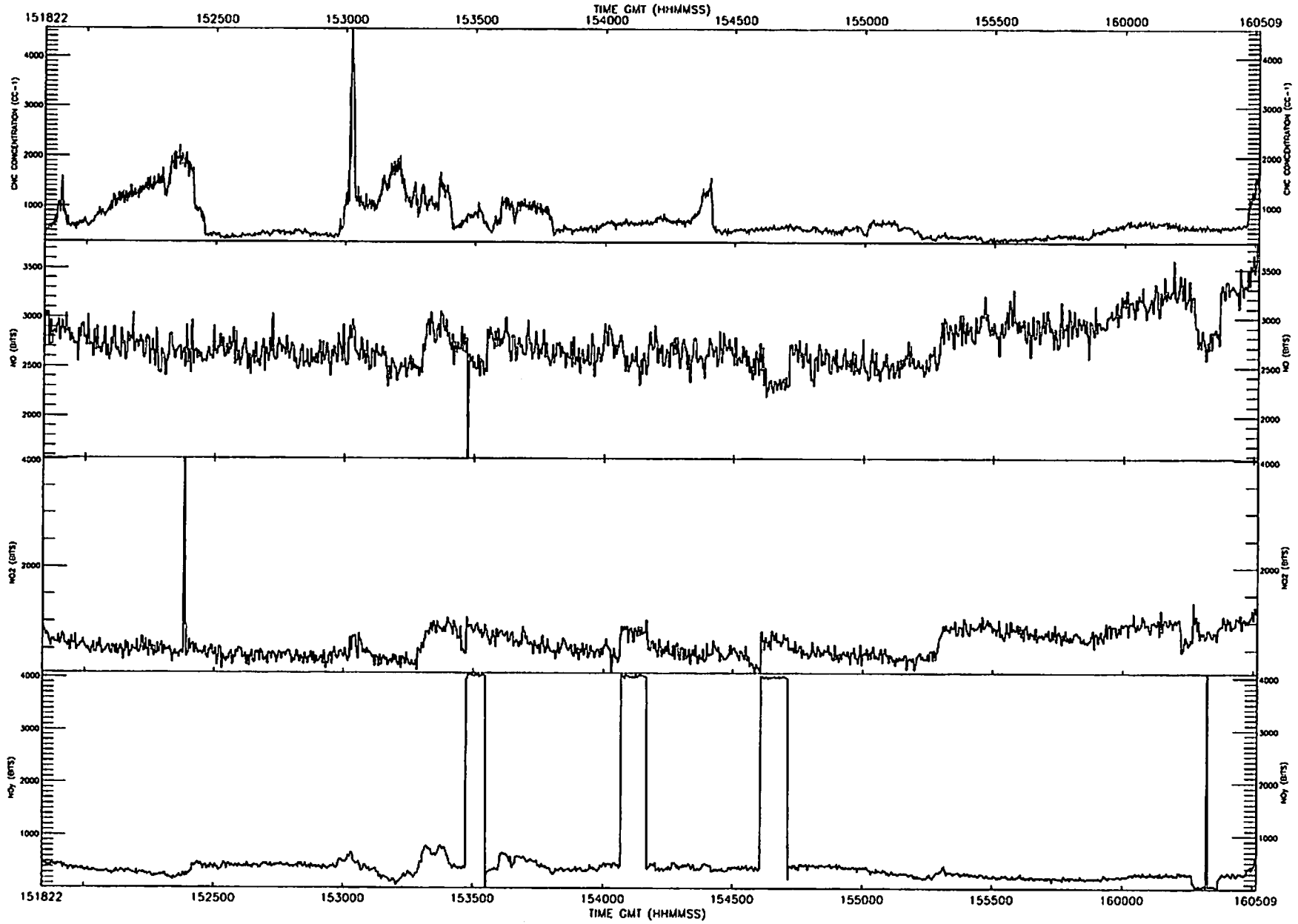
A579 20-SEP-97 P6 FL260-50' R/FL200/FL150/FL130/FL110/FL50/500' From 151822-160509 *Plotted*



A579 20-SEP-97 P6 FL260-50' R/FL200/FL150/FL130/FL110/FL50/500' From 151822-160509 *Plotted*



A579 20-SEP-97 P6 FL260-50' R/FL200/FL150/FL130/FL110/FL50/500' From 151822-160509 *Plotted*



A579 20-SEP-97 P6 FL260-50' R/FL200/FL150/FL130/FL110/FL50/500' From 151822-160509 *Plotted*

STATIC PRESSURE (MB)
No of obs 2808
Mean 653.010
Standard dev 184.493
Max value 1016.20
Min value 359.418

DEICED TRUE TEMP (DEG K)
No of obs 2808
Mean 271.038
Standard dev 13.7746
Max value 293.996
Min value 240.332

DEW POINT (DEG K)
No of obs 2808
Mean 255.224
Standard dev 19.8651
Max value 291.622
Min value 228.500

OZONE MIXING RATIO (PPB)
No of obs 2808
Mean 48.0959
Standard dev 12.6117
Max value 72.7358
Min value 25.8007

PSAP LIN ABS COEFF ()
No of obs 2808
Mean 8.250182e-07
Standard dev 2.285202e-06
Max value 2.589919e-05
Min value 1.000000e-38

JNO2 TOTAL (10-3/S)
No of obs 2808
Mean 10.8857
Standard dev 1.92287
Max value 13.1655
Min value 5.52916

PRESSURE HEIGHT (METRES)
No of obs 2808
Mean 3802.27
Standard dev 2173.82
Max value 7933.73
Min value -24.5220

CORRECTED LATITUDE (DEGREES)
No of obs 2808
Mean 42.6906
Standard dev 0.669449
Max value 43.9074
Min value 41.5770

CORRECTED LONGITUDE (DEGREES)
No of obs 2808
Mean -28.5679
Standard dev 0.667134
Max value -27.5322
Min value -29.8432

NORTHWARD WIND COMPT (M S-1)
No of obs 2808
Mean 11.9253
Standard dev 4.28283
Max value 19.4640
Min value 1.95750

EASTWARD WIND COMPT (M S-1)
No of obs 2808
Mean 15.6858
Standard dev 4.66389
Max value 24.4780
Min value 5.24509

VERTICAL WIND COMPT (M S-1)
No of obs 2808
Mean 0.148017
Standard dev 0.573212
Max value 1.79778
Min value -1.34312

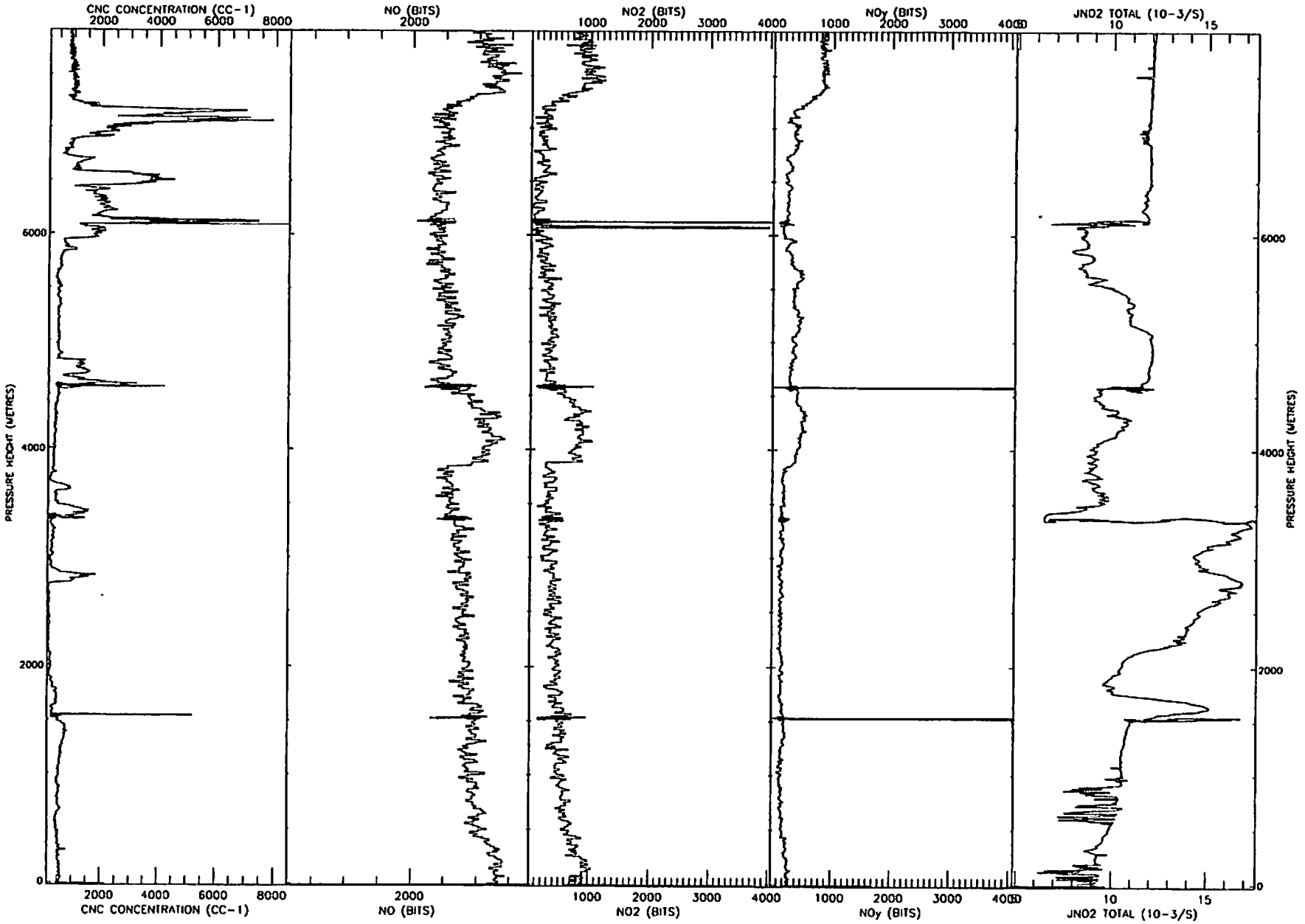
WIND SPEED (MS-1)
No of obs 2808
Mean 19.7765
Standard dev 6.10235
Max value 30.8907
Min value 6.49511

WIND DIRECTION (DEG)
Mean 232.756

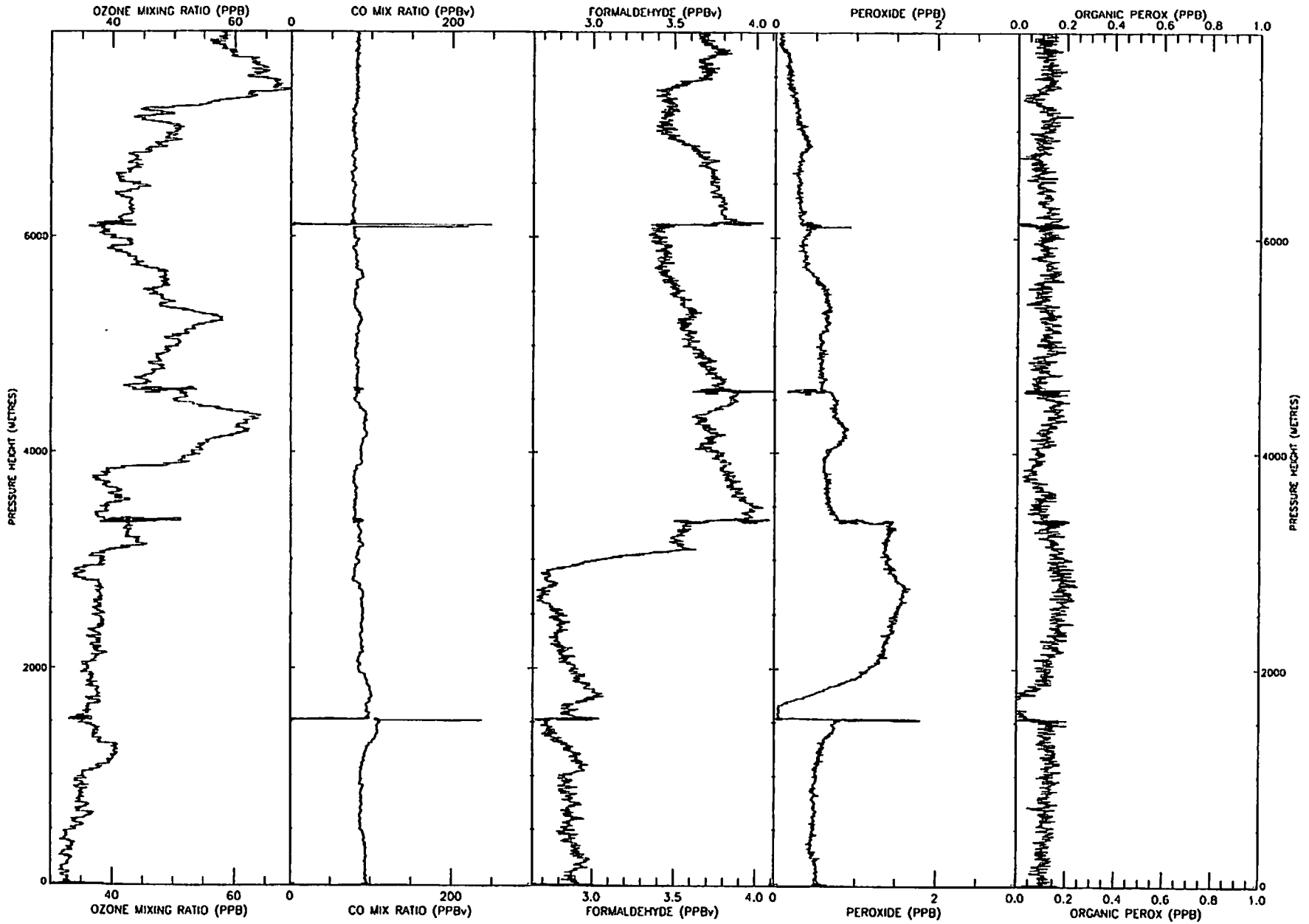
TRUE AIR SPEED (M S-1)
No of obs 2808
Mean 116.119
Standard dev 13.1913
Max value 141.831
Min value 91.8491

HEADING (DEG)
Mean 143.869

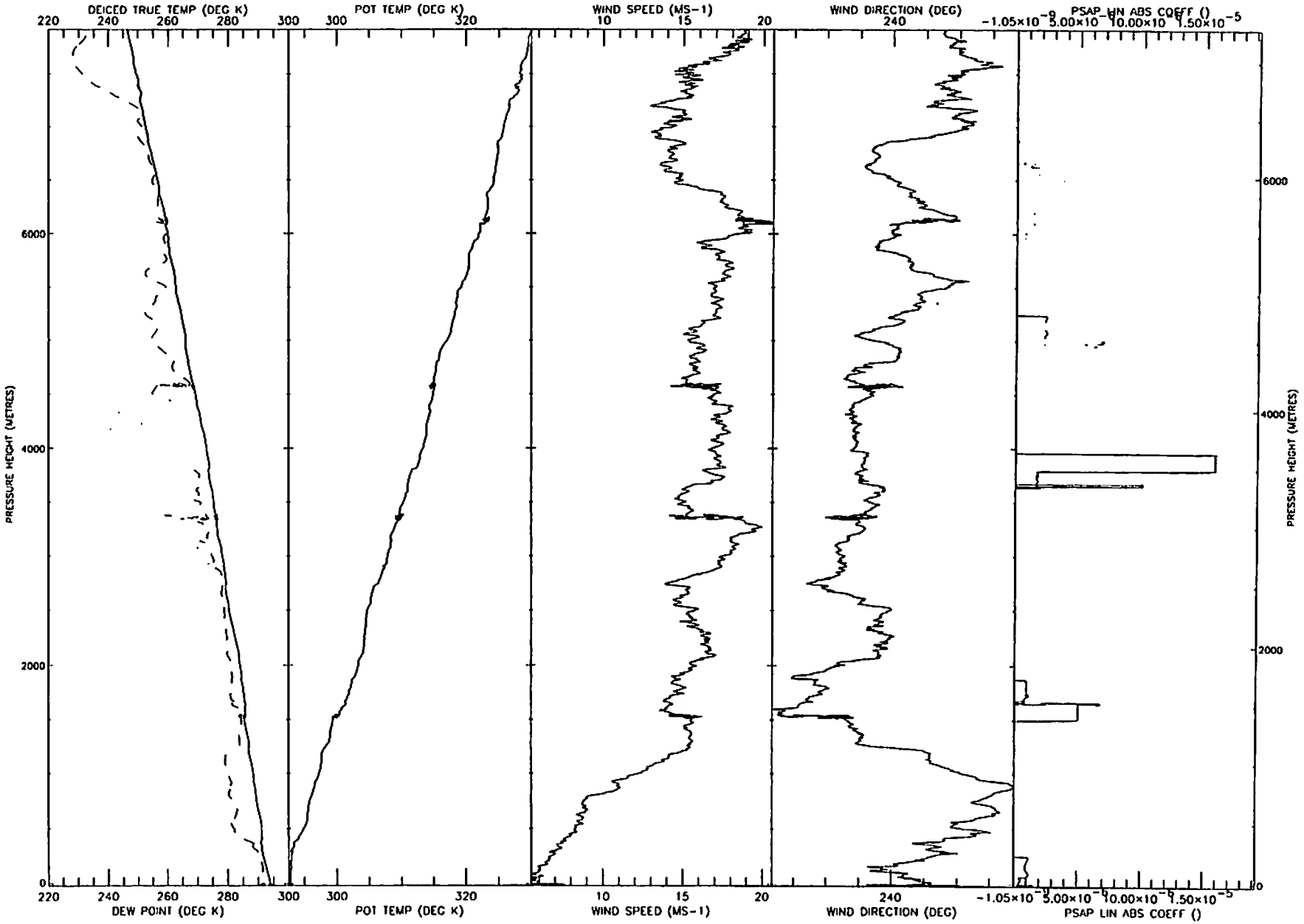
A579 20-SEP-97 P7 50'-FL260 R/100'/FL50/FL110/FL150/FL200 From 160509-165236 *Plotted 7-May*



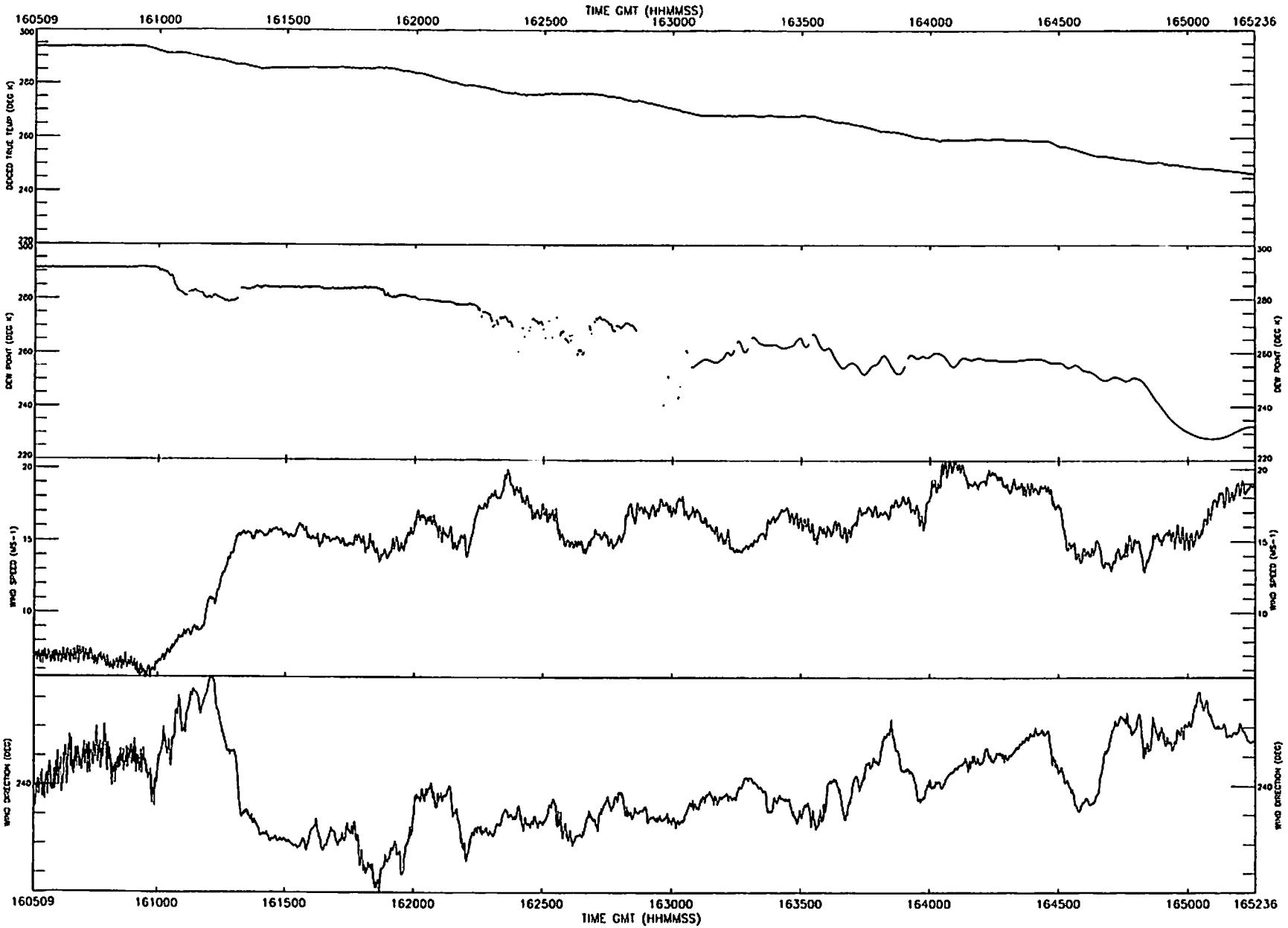
A579 20-SEP-97 P7 50'-FL260 R/100'/FL50/FL110/FL150/FL200 From 160509-165236 *Plotted 7-May*



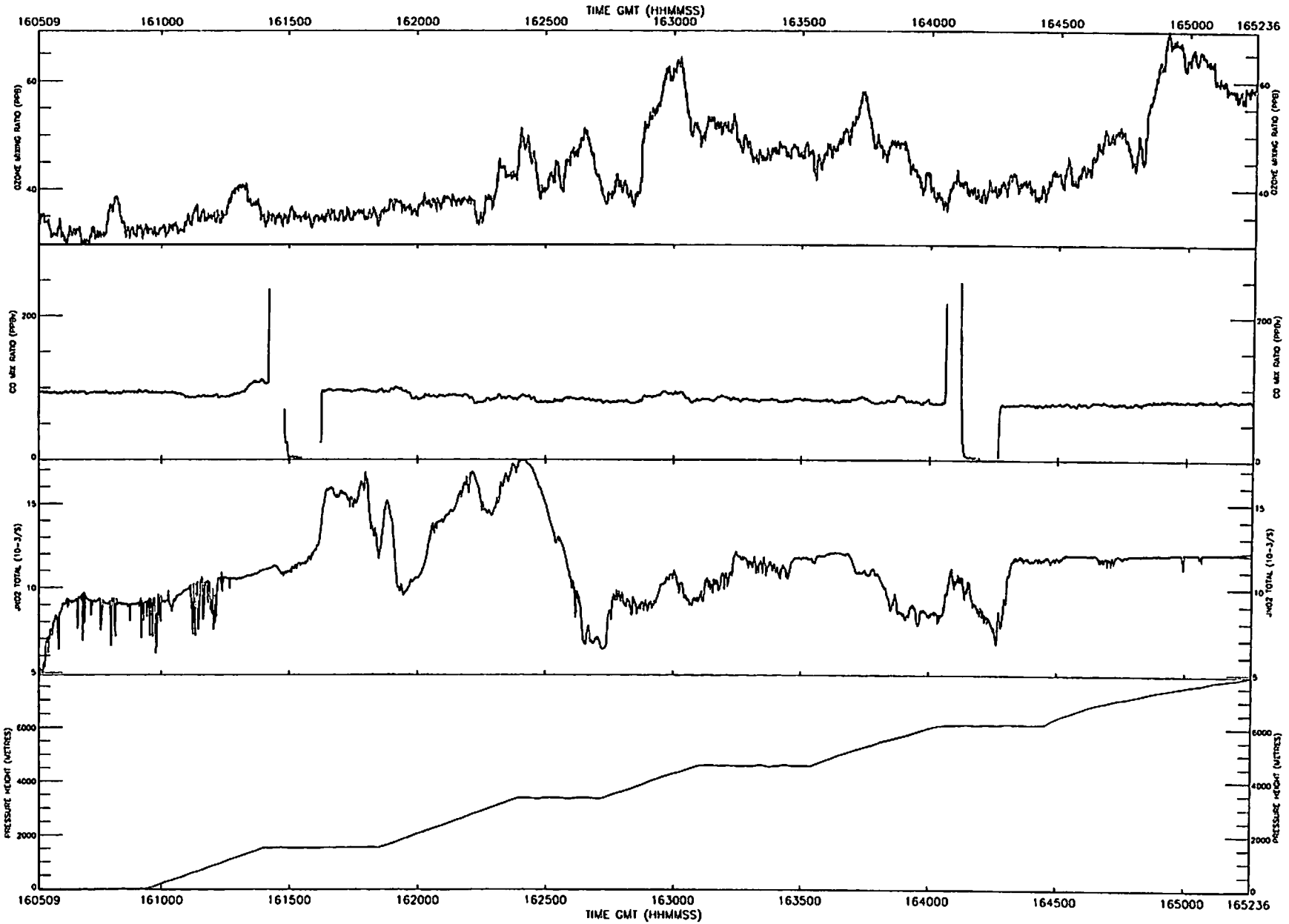
A579 20-SEP-97 P7 50'-FL260 R/100'/FL50/FL110/FL150/FL200 From 160509-165236 *Plotted 7-May*



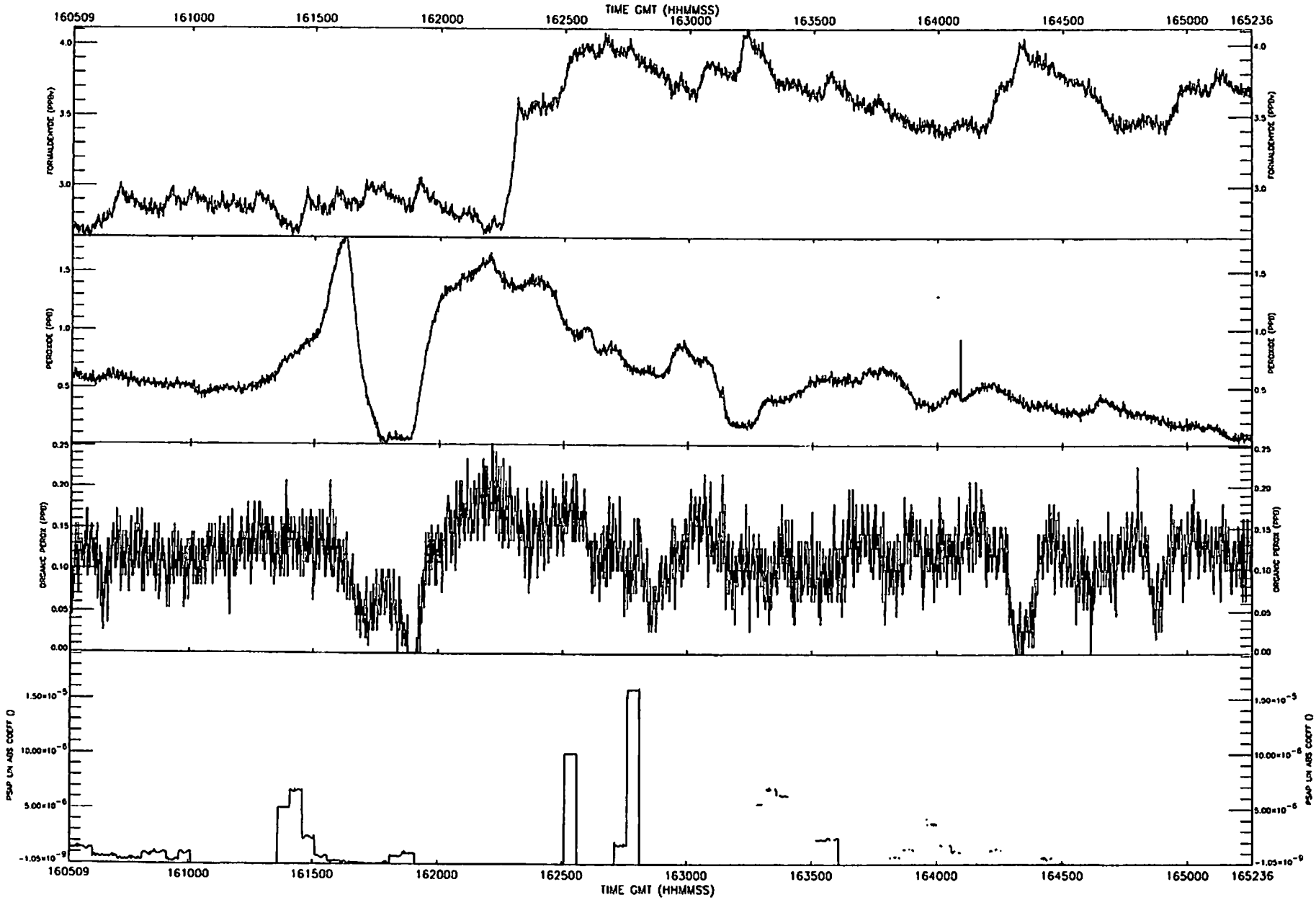
A579 20-SEP-97 P7 50'-FL260 R/100'/FL50/FL110/FL150/FL200 From 160509-165236 *Plotted 7-May*



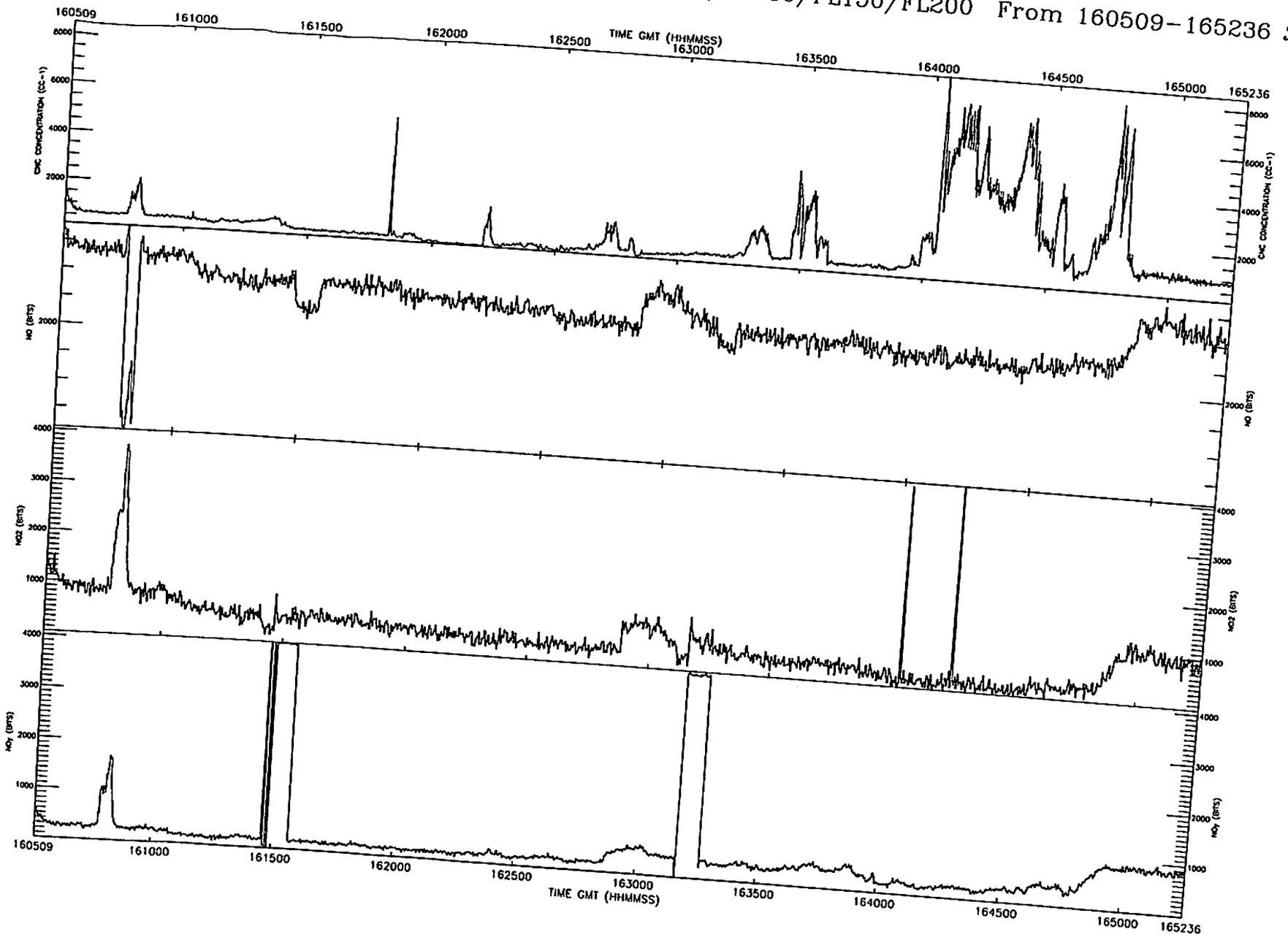
A579 20-SEP-97 P7 50'-FL260 R/100'/FL50/FL110/FL150/FL200 From 160509-165236 *Plotted 7-May*



A579 20-SEP-97 P7 50'-FL260 R/100'/FL50/FL110/FL150/FL200 From 160509-165236 *Plotted 7-May*



A579 20-SEP-97 P7 50'-FL260 R/100'/FL50/FL110/FL150/FL200 From 160509-165236 Plotted 7-May



A579 20-SEP-97 P7 50'-FL260 R/100'/FL50/FL110/FL150/FL200 From 160509-165236 Plotted 7-May

STATIC PRESSURE (MB)
No of obs 2848
Mean 658.130
Standard dev 202.688
Max value 1015.72
Min value 360.359

DEICED TRUE TEMP (DEG K)
No of obs 2848
Mean 272.522
Standard dev 14.1202
Max value 294.059
Min value 246.508

DEW POINT (DEG K)
No of obs 2848
Mean 266.603
Standard dev 16.9394
Max value 291.719
Min value 228.058

OZONE MIXING RATIO (PPB)
No of obs 2848
Mean 43.2341
Standard dev 8.88605
Max value 69.0754
Min value 29.9132

PSAP LIN ABS COEFF ()
No of obs 2848
Mean 8.008068e-07
Standard dev 2.506978e-06
Max value 1.919517e-05
Min value -1.046657e-09

JNO2 TOTAL (10-3/S)
No of obs 2848
Mean 11.1648
Standard dev 2.35217
Max value 17.5795
Min value 4.87372

PRESSURE HEIGHT (METRES)
No of obs 2848
Mean 3794.97
Standard dev 2404.99
Max value 7915.62
Min value -20.5414

CORRECTED LATITUDE (DEGREES)
No of obs 2848
Mean 40.4781
Standard dev 0.658862
Max value 41.5770
Min value 39.2795

CORRECTED LONGITUDE (DEGREES)
No of obs 2848
Mean -26.4448
Standard dev 0.705411
Max value -25.1548
Min value -27.5322

NORTHWARD WIND COMPT (M S-1)
No of obs 2848
Mean 7.47818
Standard dev 2.49155
Max value 11.4923
Min value 2.05241

EASTWARD WIND COMPT (M S-1)
No of obs 2848
Mean 12.7820
Standard dev 3.19446
Max value 18.2897
Min value 4.84004

VERTICAL WIND COMPT (M S-1)
No of obs 2848
Mean -0.689927
Standard dev 0.630951
Max value 0.854958
Min value -2.53098

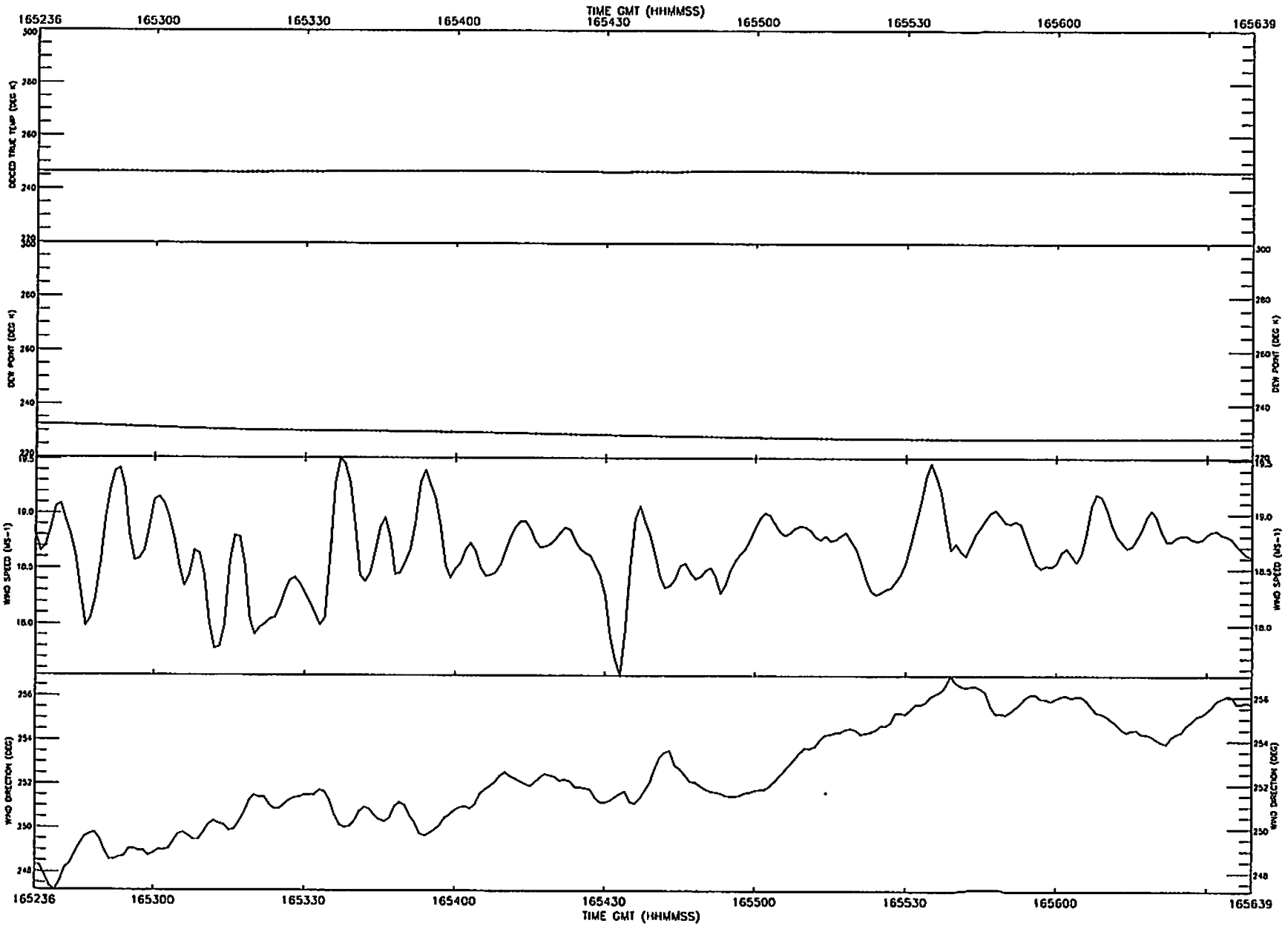
WIND SPEED (MS-1)
No of obs 2848
Mean 14.9228
Standard dev 3.60857
Max value 20.6049
Min value 5.49747

WIND DIRECTION (DEG)
Mean 239.670

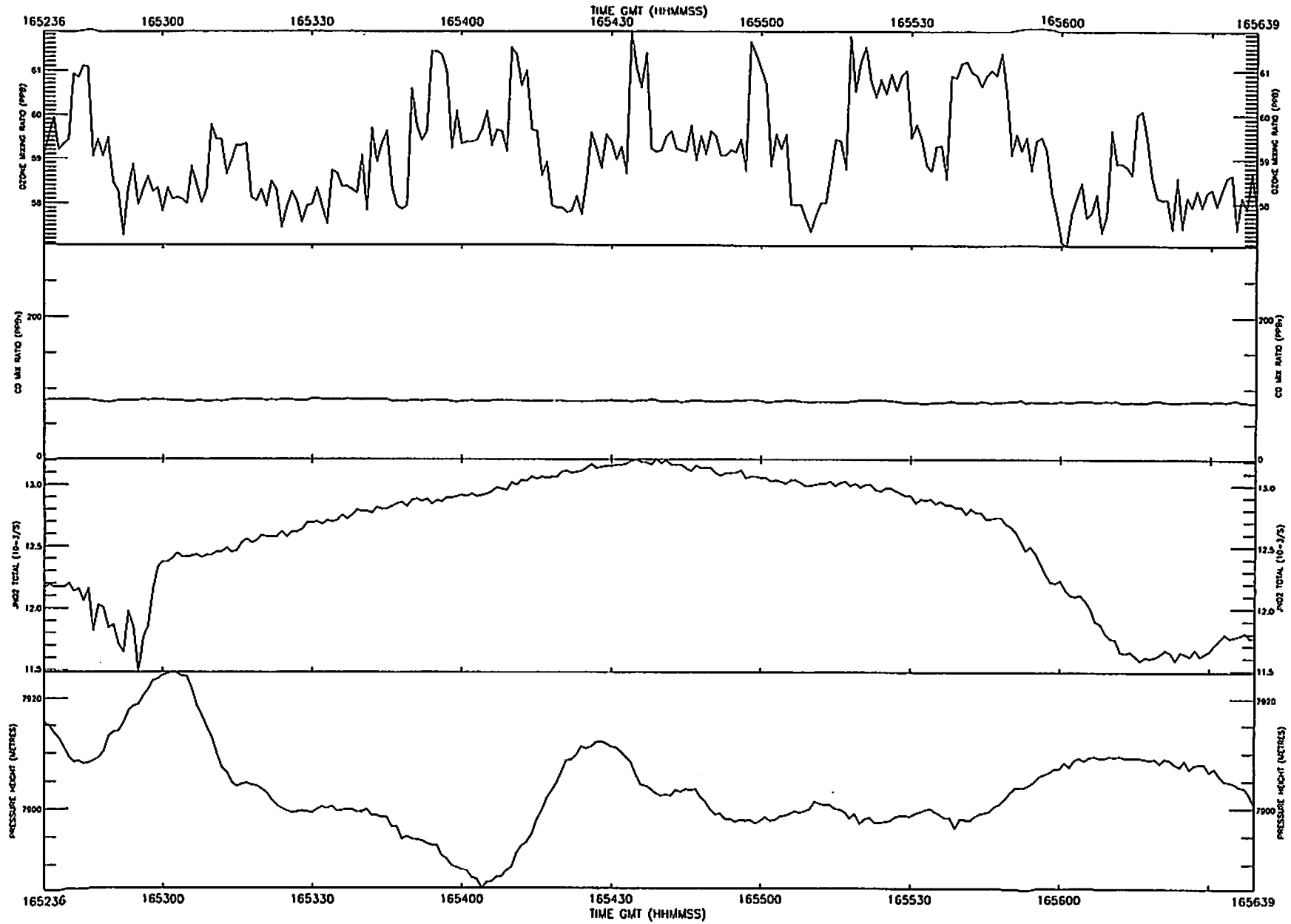
TRUE AIR SPEED (M S-1)
No of obs 2848
Mean 113.194
Standard dev 12.4918
Max value 148.351
Min value 90.4710

HEADING (DEG)
Mean 141.647

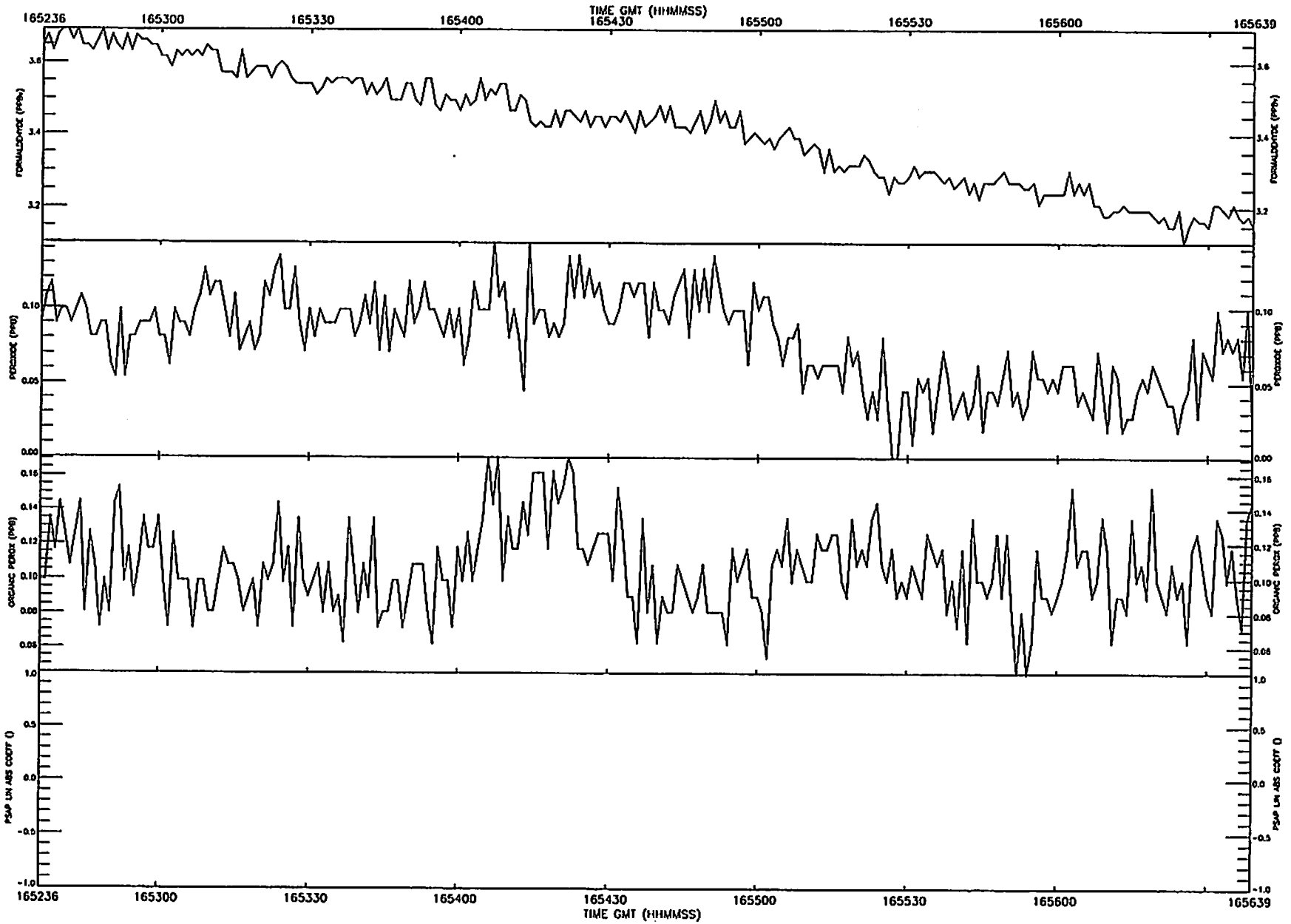
A579 20-SEP-97 R5 FL260 From 165236-165639 *Plotted 7-May-1998 11:08*



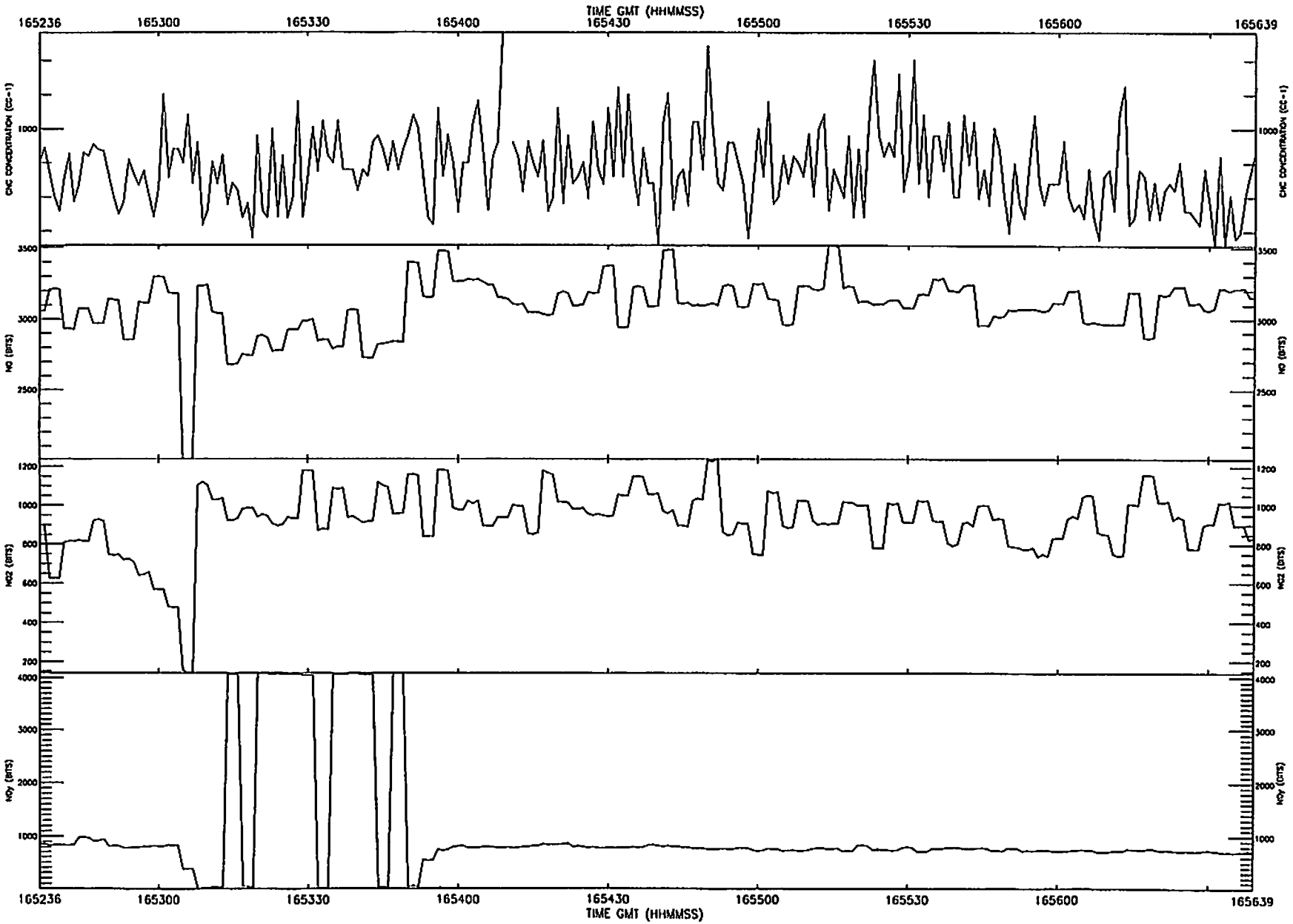
A579 20-SEP-97 R5 FL260 From 165236-165639 *Plotted 7-May-1998 11:08*



A579 20-SEP-97 R5 FL260 From 165236-165639 *Plotted 7-May-1998 11:08*



A579 20-SEP-97 R5 FL260 From 165236-165639 *Plotted 7-May-1998 11:08*



A579 20-SEP-97 R5 FL260 From 165236-165639 Plotted 7-May-1998 11:09

STATIC PRESSURE (MB)
No of obs 244
Mean 360.992
Standard dev 0.410376
Max value 361.932
Min value 359.880

DEICED TRUE TEMP (DEG K)
No of obs 244
Mean 246.611
Standard dev 0.179165
Max value 246.912
Min value 246.227

DEW POINT (DEG K)
No of obs 244
Mean 228.923
Standard dev 1.57800
Max value 232.500
Min value 227.286

OZONE MIXING RATIO (PPB)
No of obs 244
Mean 59.1304
Standard dev 1.11856
Max value 61.8684
Min value 57.0599

PSAP LIN ABS COEFF ()
No of obs 244
Mean 1.000000e-38
Standard dev 0.000000
Max value 1.000000e-38
Min value 1.000000e-38

JNO2 TOTAL (10-3/S)
No of obs 244
Mean 12.5998
Standard dev 0.504924
Max value 13.2120
Min value 11.4854

PRESSURE HEIGHT (METRES)
No of obs 244
Mean 7903.46
Standard dev 7.88037
Max value 7924.83
Min value 7885.42

CORRECTED LATITUDE (DEGREES)
No of obs 244
Mean 39.1609
Standard dev 7.273820e-02
Max value 39.2795
Min value 39.0322

CORRECTED LONGITUDE (DEGREES)
No of obs 244
Mean -25.0363
Standard dev 6.929799e-02
Max value -24.9183
Min value -25.1548

NORTHWARD WIND COMPT (M S-1)
No of obs 244
Mean 5.61539
Standard dev 0.755844
Max value 7.39513
Min value 4.21619

EASTWARD WIND COMPT (M S-1)
No of obs 244
Mean 17.7968
Standard dev 0.415608
Max value 18.8904
Min value 16.6370

VERTICAL WIND COMPT (M S-1)
No of obs 244
Mean -0.976495
Standard dev 0.262763
Max value -0.480423
Min value -1.70301

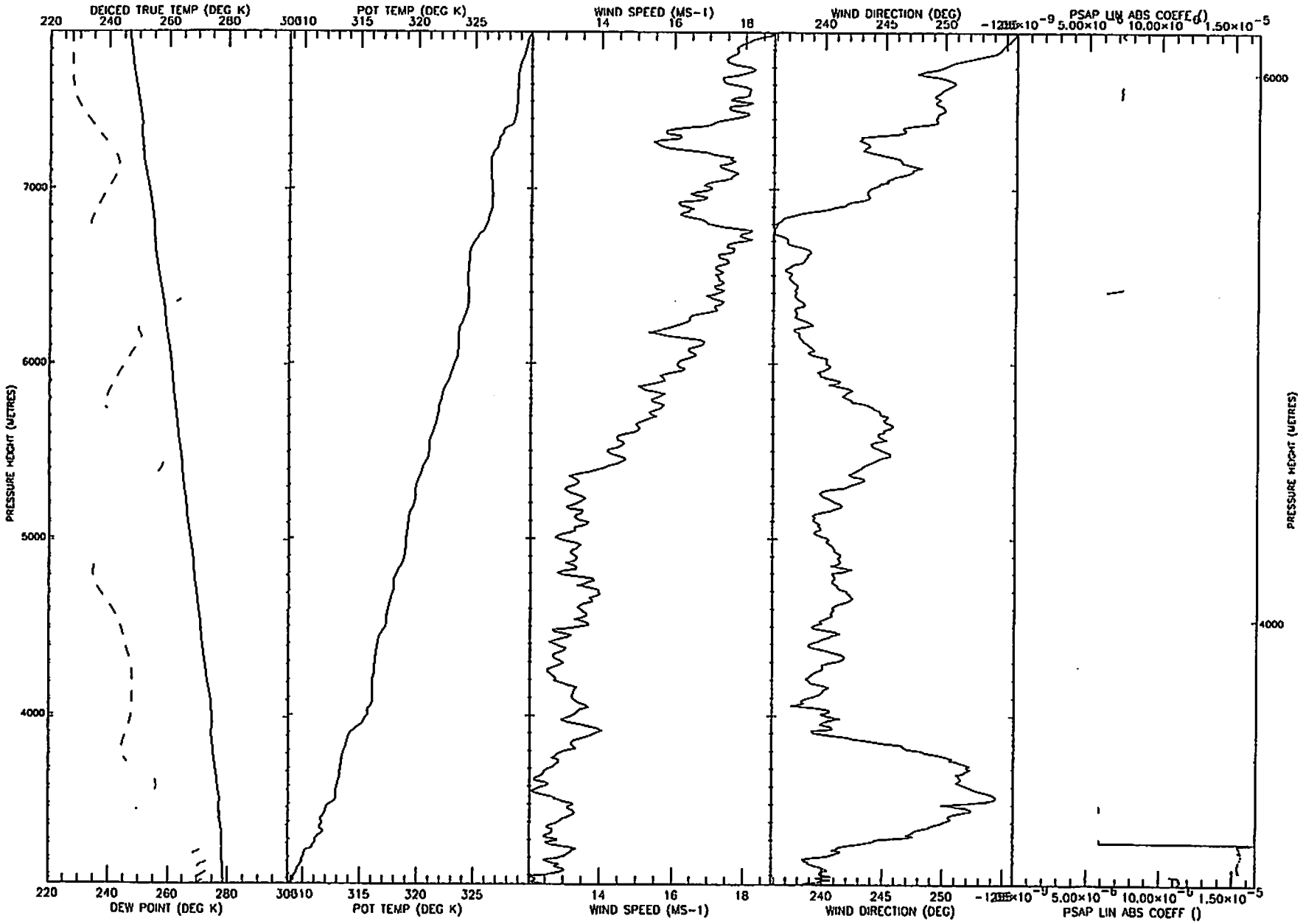
WIND SPEED (MS-1)
No of obs 244
Mean 18.6785
Standard dev 0.338484
Max value 19.5153
Min value 17.5369

WIND DIRECTION (DEG)
Mean 252.488

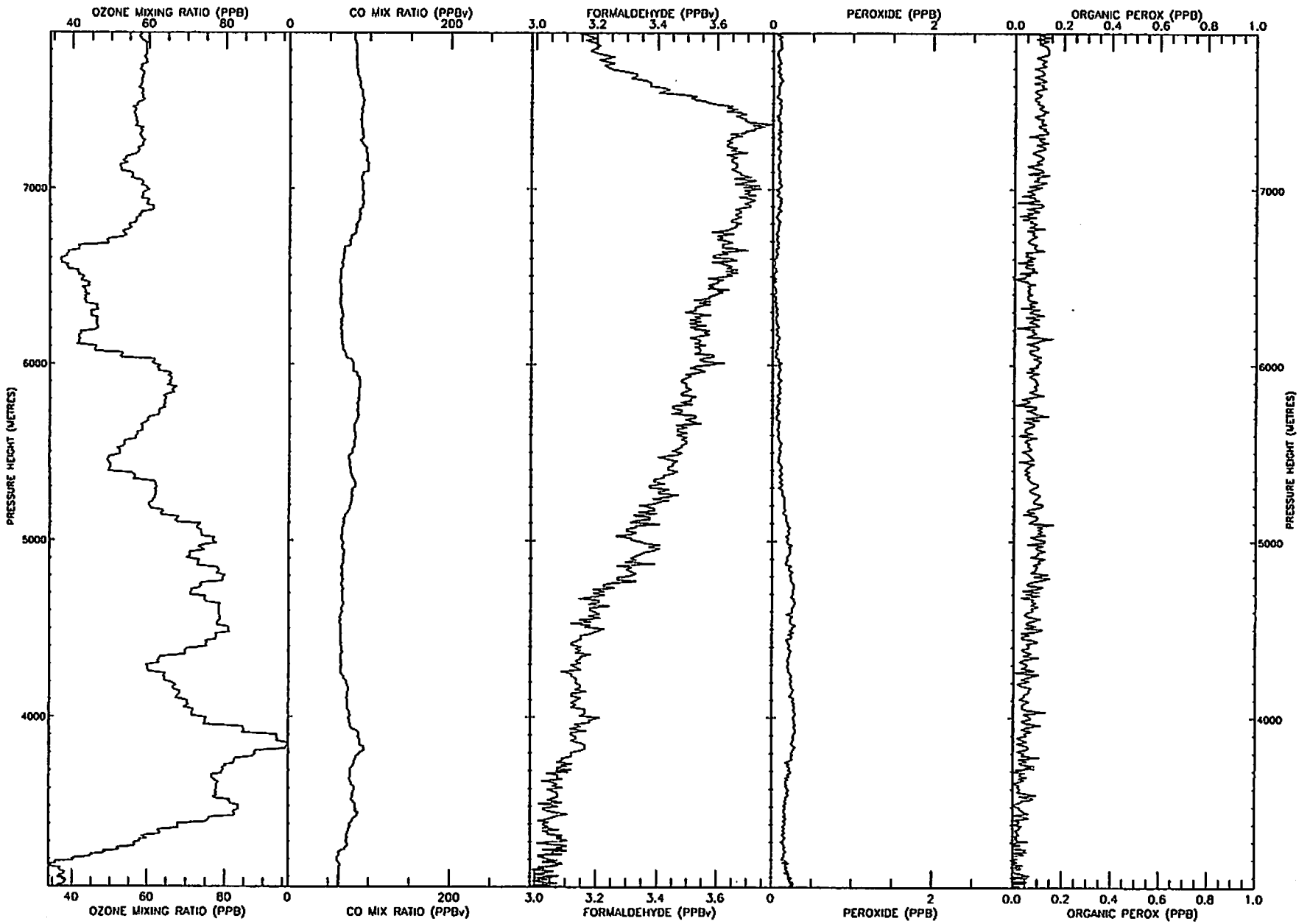
TRUE AIR SPEED (M S-1)
No of obs 244
Mean 135.813
Standard dev 7.19103
Max value 144.427
Min value 119.510

HEADING (DEG)
Mean 143.350

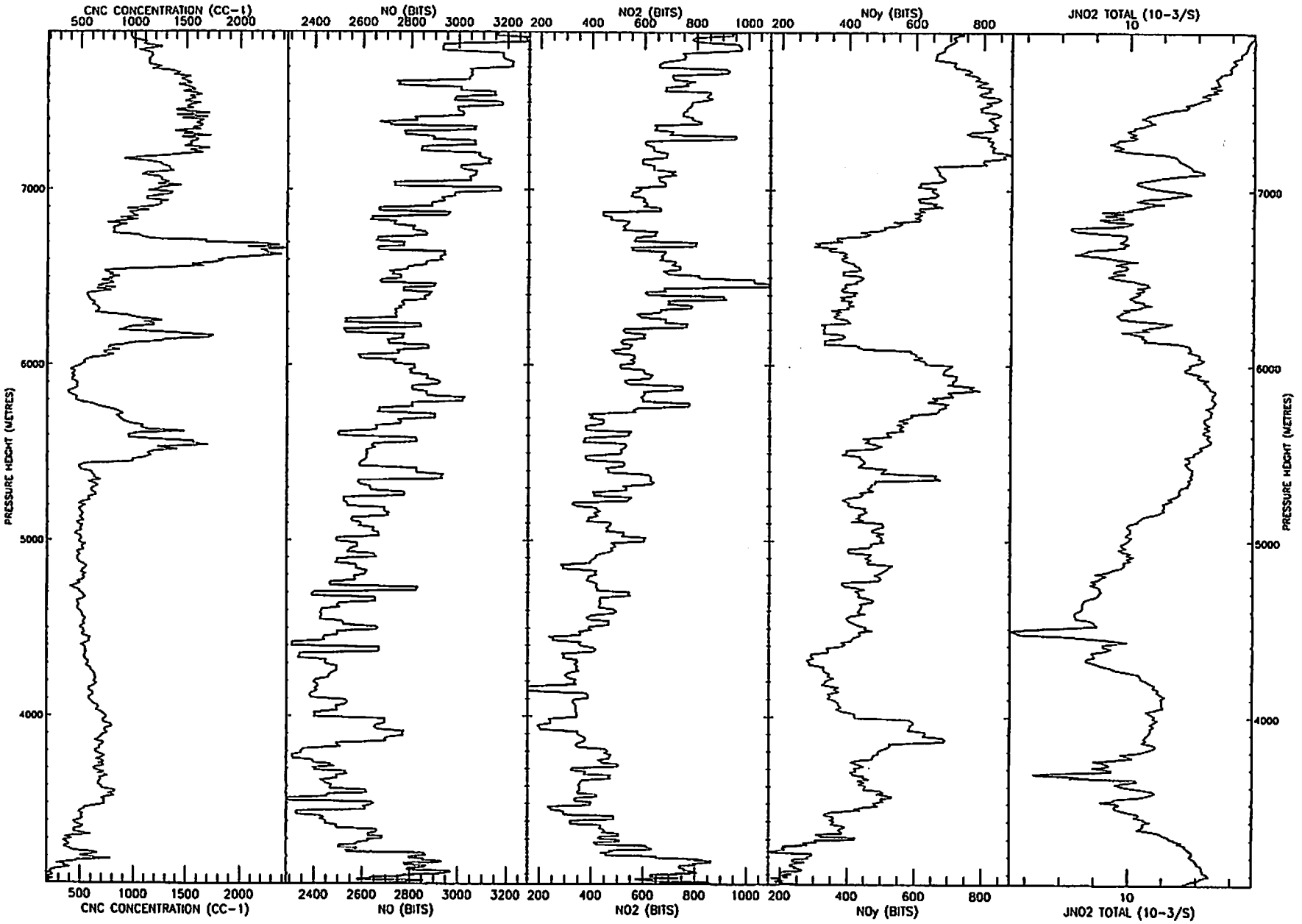
A579 20-SEP-97 P8 FL260-FL100 From 165639-170520 *Plotted 7-May-1998 11:11*



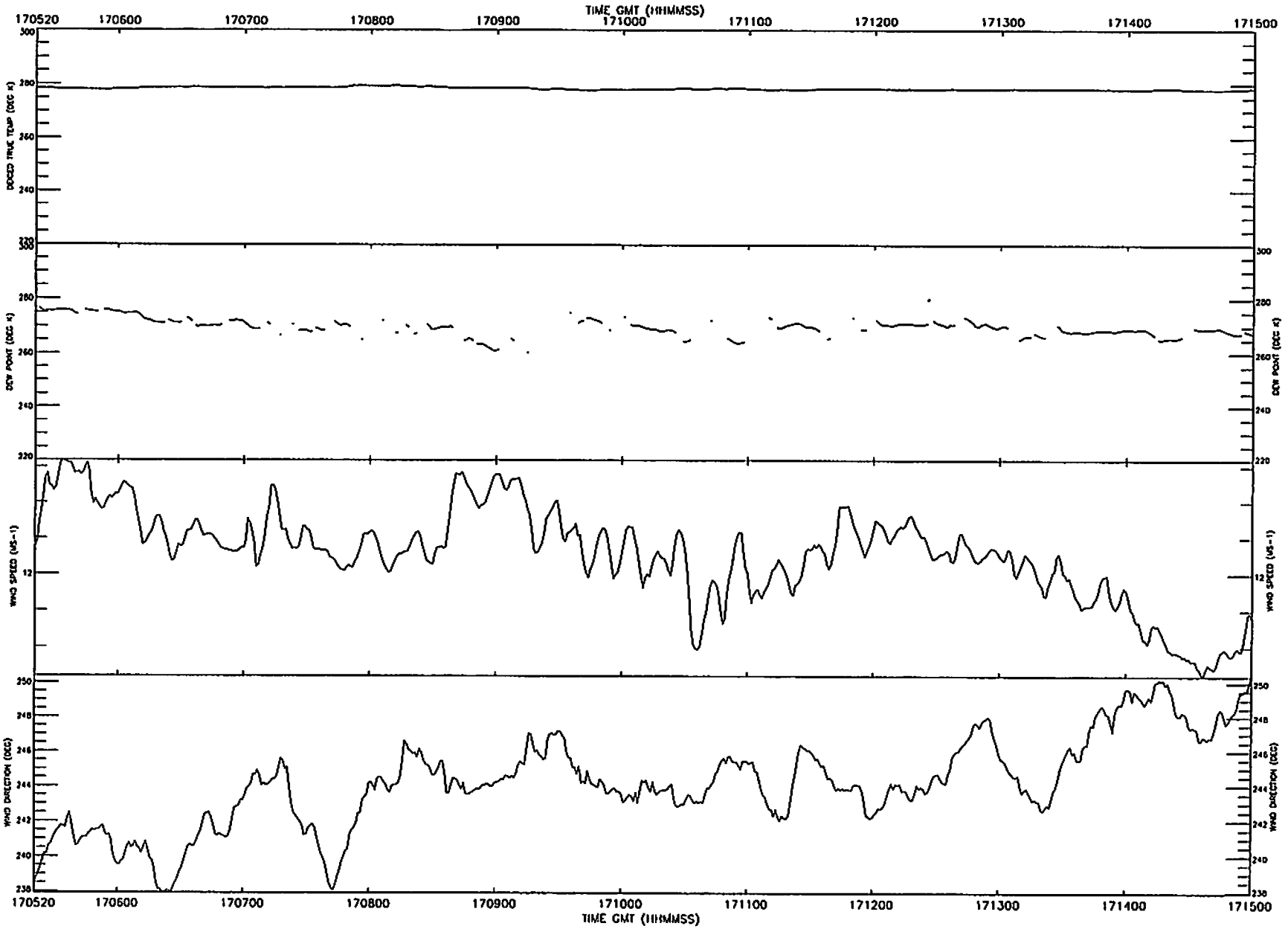
A579 20-SEP-97 P8 FL260-FL100 From 165639-170520 *Plotted 7-May-1998 11:11*



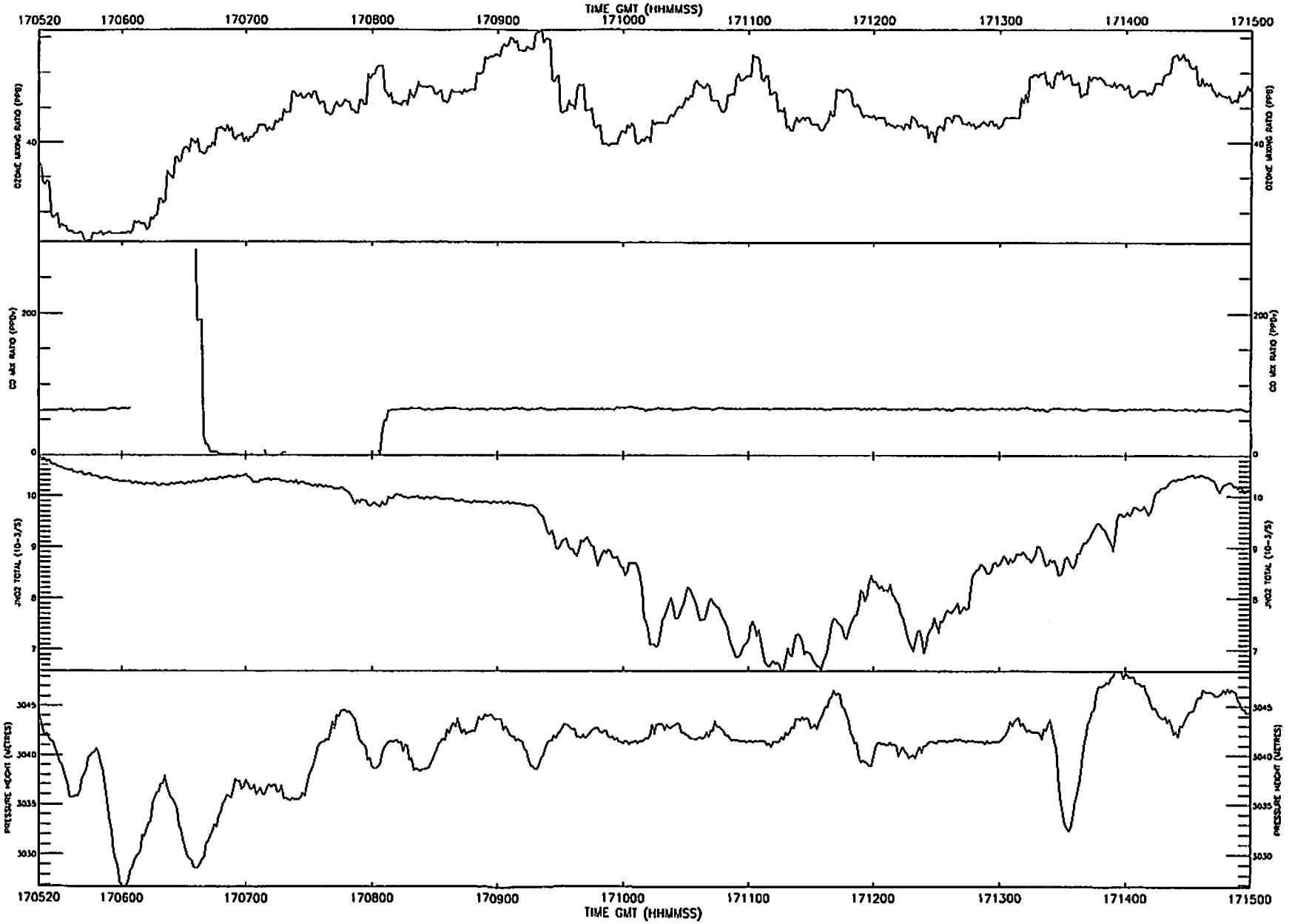
A579 20-SEP-97 P8 FL260-FL100 From 165639-170520 *Plotted 7-May-1998 11:11*



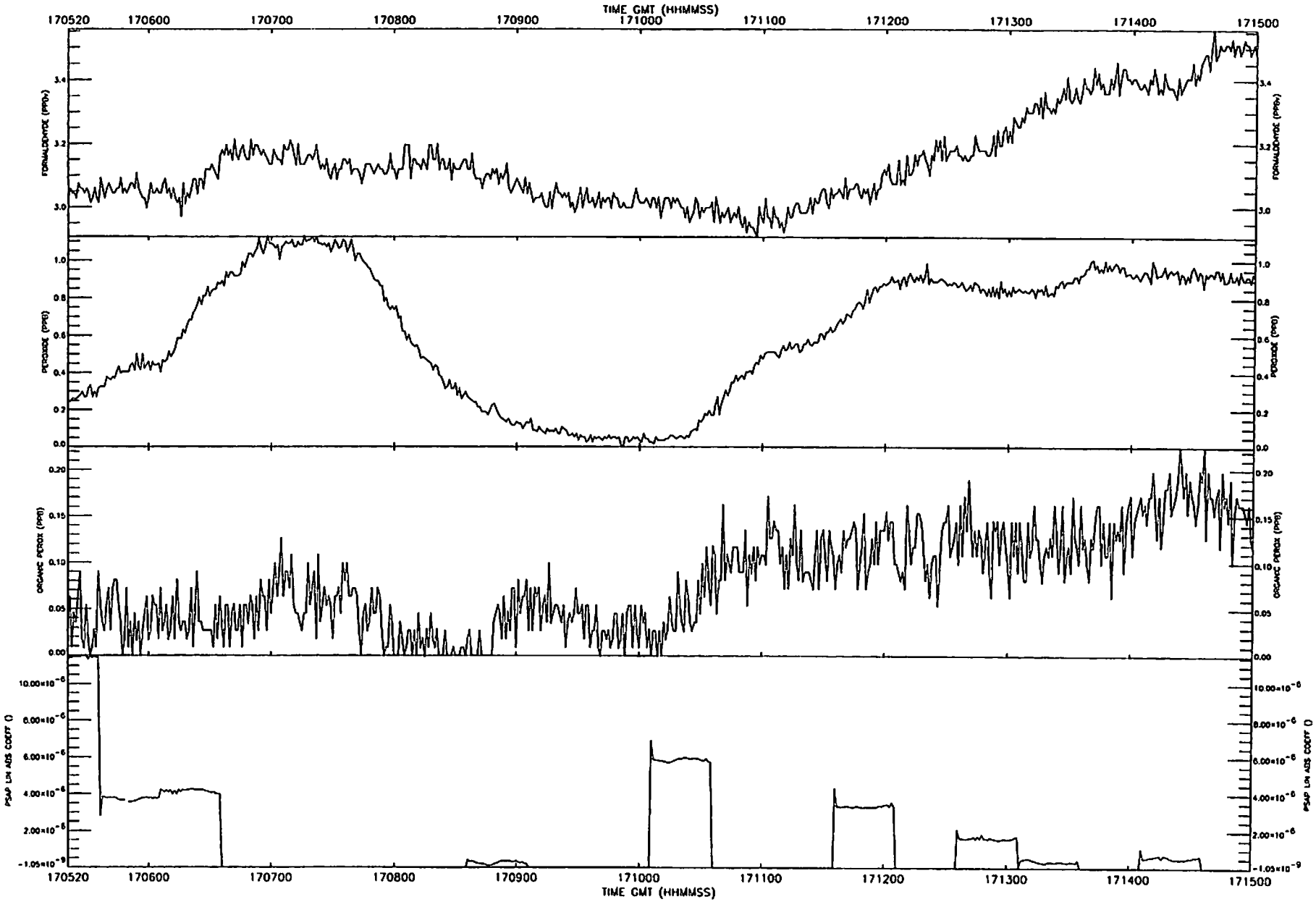
A579 20-SEP-97 R6 FL100 From 170520-171500 *Plotted 7-May-1998 11:13*



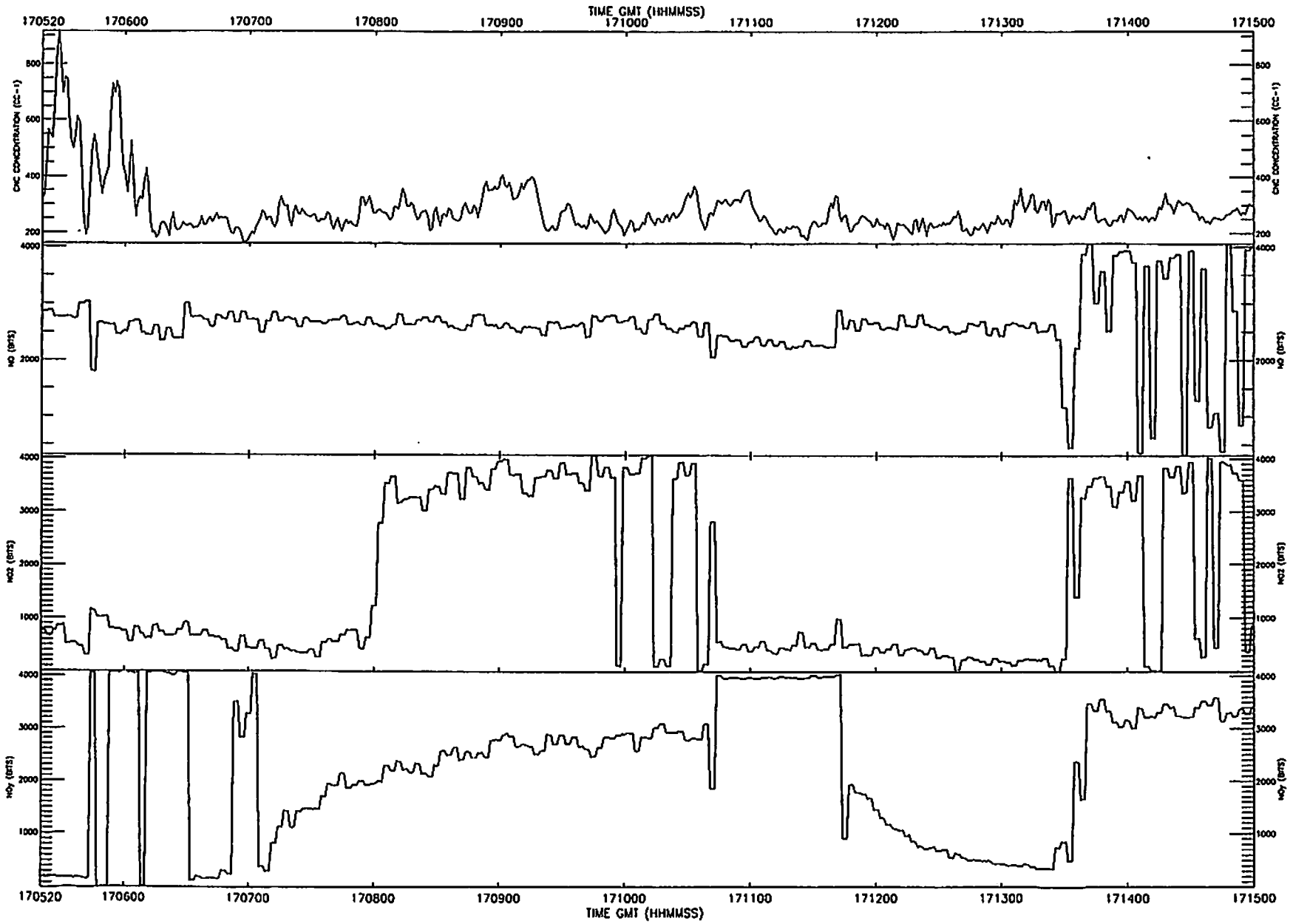
A579 20-SEP-97 R6 FL100 From 170520-171500 *Plotted 7-May-1998 11:14*



A579 20-SEP-97 R6 FL100 From 170520-171500 *Plotted 7-May-1998 11:14*



A579 20-SEP-97 R6 FL100 From 170520-171500 *Plotted 7-May-1998 11:14*



A579 20-SEP-97 R6 FL100 From 170520-171500 *Plotted 7-May-1998 11:14*

STATIC PRESSURE (MB)
No of obs 581
Mean 697.458
Standard dev 0.366933
Max value 698.695
Min value 696.764

DEICED TRUE TEMP (DEG K)
No of obs 581
Mean 278.453
Standard dev 0.356144
Max value 279.474
Min value 277.833

DEW POINT (DEG K)
No of obs 581
Mean 269.593
Standard dev 3.06032
Max value 276.392
Min value 260.422

OZONE MIXING RATIO (PPB)
No of obs 581
Mean 43.9345
Standard dev 6.51212
Max value 56.0558
Min value 25.6864

PSAP LIN ABS COEFF ()
No of obs 581
Mean 1.337348e-06
Standard dev 2.444039e-06
Max value 1.157530e-05
Min value -1.046657e-09

JNO2 TOTAL (10-3/S)
No of obs 581
Mean 9.16526
Standard dev 1.18809
Max value 10.7919
Min value 6.59312

PRESSURE HEIGHT (METRES)
No of obs 581
Mean 3040.73
Standard dev 4.13169
Max value 3048.54
Min value 3026.80

CORRECTED LATITUDE (DEGREES)
No of obs 581
Mean 38.1808
Standard dev 0.134692
Max value 38.4156
Min value 37.9409

CORRECTED LONGITUDE (DEGREES)
No of obs 581
Mean -24.1782
Standard dev 0.129634
Max value -24.0024
Min value -24.4003

NORTHWARD WIND COMPT (M S-1)
No of obs. 581
Mean 5.36412
Standard dev 0.687313
Max value 6.75846
Min value 3.75096

EASTWARD WIND COMPT (M S-1)
No of obs 581
Mean 11.0411
Standard dev 0.493669
Max value 12.1100
Min value 9.74683

VERTICAL WIND COMPT (M S-1)
No of obs 581
Mean 9.564250e-02
Standard dev 0.724942
Max value 2.49545
Min value -0.892120

WIND SPEED (MS-1)
No of obs 581
Mean 12.2878
Standard dev 0.636502
Max value 13.5915
Min value 10.6017

WIND DIRECTION (DEG)
Mean 244.088

TRUE AIR SPEED (M S-1)
No of obs 581
Mean 111.290
Standard dev 1.45975
Max value 114.865
Min value 107.186

HEADING (DEG)
Mean 147.792

Glossary

Aircraft Position, Speed and Attitude

- **Navigation:** The aircraft carries GPS, OMEGA, and inertial navigation systems.
- **Pressure height:** is based on the standard atmosphere as specified by the International Civil Aviation Organisation (sea level pressure of 1013.25 hPa). Pressure height is quoted in terms of Flight Levels (height in hundreds of feet *e.g.* FL100 = 10000 feet).
- **Radar height:** altitude of the aircraft above surface, measured by radar.
- **Time:** All times are UTC.

General meteorology

- **Tephigrams:** are given for every major profile of each flight. A tephigram is a thermodynamic diagram (temperature (T) - entropy (ϕ) diagram) used to assess the static stability of a given atmospheric profile. Other meteorological organisations use similar diagrams such as the Emagram or the Skew T log p diagram.
- **Deiced true temperature:** air temperature with corrections for aircraft speed and altitude.
- **Potential temperature:** the temperature that a parcel of air would have if it follows a dry adiabatic lapse rate to the 1000 hPa level.
- **Dew point:** dew point (the temperature at which a sample of air would just become saturated with respect to a plane surface of water if cooled at a constant pressure) calculated from the chilled mirror General Eastern hygrometer.

Particle Data

- **CNC:** Condensation nucleus counter (this data is provisional and requires further validation). The measurement is from a commercial instrument: TSI INC Model 3025A. Although CNC data were recorded on the flight no post flight processing has been carried out. Rather than delay this booklet further, I have decided to wait and process the data when the validation has been carried out by the cloud physics group.
- **PSAP:** The Radiance Research Particle Soot Absorption Photometer gives a measurement of optical absorption by black carbon, using a quartz filter with the absorption measured at 565 nm.

Chemistry Parameters

- **Ozone:** Calibrated readings from the TECO 49 ozone analyser in ppb. Instrument scientist: Joss Kent and Ken Dewey (UK Met. Office).

- **JNO_2:** The sum of upward and downward facing radiometers (data not quality controlled). Instrument scientists: Christoph Gerbig and Sandra Schmitgen (FZ Jülich).

- **Hydrogen peroxide:** Raw data recorded in ppb (approx.). Instrument scientist: Brian Bandy (UEA Norwich).

- **Organic peroxide:** Raw data recorded in ppb (approx.). Instrument scientist: Brian Bandy (UEA Norwich).

- **Formaldehyde:** Raw data (approx) converted to ppb using approximate scale factor and offset. Instrument scientist: Graham Mills (UEA, Norwich).

- **NOxy:** Parameters (NO, NO_2, NO_{y1}) were recorded on MRF's data recording system and are plotted in bits. Only one NOy channel was available for this flight. Instrument scientist: Stephane Bauguitte (UEA, Norwich).

- **Bottles:** Please refer to the bottle flight logs (within the flight folder section) to see when these were filled. Analysis carried out at NILU.

- **CO:** Approximate data in ppb from the DRS. Instrument scientist: Sandra Schmitgen (fz-Jülich).

Natural Environment Research Council

ARASF

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